1988

Clients' Expectations And Results Of Psychological Therapy For Dysmenorrhea

Helene Suzanne Wallach

NOTICE

The quality of this microform is heavily dependent upon the quality of the original thesis submitted for microfilming. Every effort has been made to ensure the highest quality of reproduction possible.

If pages are missing, contact the university which granted the degree.

Some pages may have indistinct print especially if the original pages were typed with a poor typewriter ribbon or if the university sent us an inferior photocopy.

Previously copyrighted materials (journal articles, published tests, etc.) are not filmed.

Reproduction in full or in part of this microform is governed by the Canadian Copyright Act, R.S.C. 1970, c. C-30.

AVIS

La qualité de cette microforme dépend grandement de la qualité de la thèse soumise au microfilmage. Nous avons tout fait pour assurer une qualité supérieure de reproduction.

S'il manque des pages, veuillez communiquer avec l'université qui a conféré le grade

La qualité d'impression de certaines pages peut laisser à désirer, surtout si les pages originales ont été dactylographiées à l'aide d'un ruban usé ou si l'université nous a fait parvenir une photocopie de qualité inférieure

Les documents qui font déjà l'objet d'un droit d'auteur (articles de revue, tests publiés, etc.) ne sont pas microfilmés.

La reproduction, même partielle, de cette microforme est soumise à la Loi canadienne sur le droit d'auteur, SRC 1970, c. C-30.

CLIENTS' EXPECTATIONS AND RESULTS OF PSYCHOLOGICAL THERAPY FOR DYSMENORRHEA

by

Helene S. Wallach

Department of Psychology

Submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy

Faculty of Graduate Studies
The University of Western Ontario
London, Ontario
January, 1988

ISBN 0-315-40802-2

ABSTRACT

Dysmenorrhea affects womens' productivity, social life and sleep patterns, and is exacerbated by stress and negative affect. This study had two main goals: (a) to find an effective psychological treatment for dysmenorrhea and (b) to investigate the effect of matching treatment to expectations. Specifically, this study proposed that (a) women would benefit more from a cognitive or somatic treatment than they would from a wait-list period, (b) a combined treatment (combining cognitive and somatic elements) would be superior to either treatment alone and (c) matching treatment approach to expectations would result in more benefit from therapy.

Three studies were conducted addressing these hypotheses. Study 1 demonstrated the need for and scope of a psychological treatment for these women. In Study 2, the treatment expectation questionnaire was developed and tested. In Study 3, women received a cognitive treatment (relabeling, distraction, coping statements), a somatic treatment (relaxation, numbing of discomfort area), or waited to receive a combined treatment.

Women in all the groups displayed reductions on all pain measures and most non-pain measures from pre- to post-treatment. The cognitive treatment group improved significantly more than the somatic treatment group on sensory pain, evaluative pain, Moos behavior and social interference. There were no significant differences between the treatment groups and the wait-list control group; however, there were trends for the cognitive treatment group to improve more than the control group on evaluative pain and social interference. There were no significant differences between the combined treatment group and

the other treatment groups. It was suggested that the dramatic improvement in the wait-list control group during their waiting period was a result of expectations for improvement, and may be the cause for the lack of significant findings. In addition, reduction in medication use after treatment, which occurred only in the cognitive and combined treatment groups, may have masked treatment effects between the groups.

No matching effect was found. Perhaps the information provided in the first session helped women change their expectations, therefore attenuating the matching effect.

ACKNOWLEDGMENTS

Appreciation is extended to Dr. Gary B. Rollman for his continuous assistance in the conception and design of this research project. I wish to thank Dr. Rod Martin for his helpful comments on numerous drafts of the proposal and the thesis, and Dr. Rickey Miller, for her valuable input at all stages of the research. And finally, I extend special thanks to Dr. Bob Gardner and Dr. Tony Vernon for their invaluable statistical advice, and to Dr. David Evans for his input.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

CLIENTS' EXPECTATIONS AND RESULTS OF PSYCHOLOGICAL THERAPY FOR DYSMENORRHEA

This study has a dual goal: (a) to find an effective psychological treatment for the disabling pain of dysmenorrhea, and (b) to test if matching treatment to dysmenorrheic patient expectations results in more benefit from treatment than mismatching. To this end, three interlinked studies were conducted. In the first study, the need for psychological treatment of dysmenorrhea was investigated as well as the characteristics of this population. In Study 2, a treatment expectations questionnaire was developed. Finally, in Study 3, the effects of psychological treatment for dysmenorrhea and the effects of matching expectations to treatment were examined.

The introduction is divided into two sections to match the dual goals of the thesis. The first section presents information on dysmenorrhea, its epidemiology, etiology and treatment. The second section pertains to treatment matching and thus it covers information on expectations which is relevant to treatment in general.

Dysmenorrhea

Dysmenorrhea means painful menstruation. It starts in adolescence, within 2 years of the menarche. Pain usually starts on the first day of menses, or the day before, and lasts for 1-2 days. The pain is cramping in the lower abdomen and may also spread to the back and thighs. The pain may be accompanied by nausea, vomiting, diarrhea and headache (Danforth, 1982).

There are two types of dysmenorrhea: primary and secondary. When no evidence of organic pathology (e.g., fibroids) is found,

primary dysmenorrhea is diagnosed. Otherwise it is diagnosed as secondary dysmenorrhea.

Pre-menstrual syndrome (PMS), mood cycle changes and dysmenorrhea are all influenced by hormonal changes throughout the menstrual cycle. PMS is used "to refer to those cases in which a woman has a particularly severe combination of physical and psychological symptoms premenstrually" (Hyde, 1986, p. 99). The symptoms are any one or more of: tension, depression, irritability, backache and water retention. Mood cycle changes are less well defined and generally refer to the tendency, in women, to be more happy and optimistic around the time of ovulation and more pessimistic, anxious and hostile during the four days premenstrually (Hyde, 1986). In contrast to the emphasis on mood and performance for PMS and mood cycle changes, for dysmenorrhea the emphasis is on pain and its consequences. The pain is limited to the days of the menses (and perhaps one day before the menses).

Women who experience dysmenorrhea may also experience PMS; as these conditions are probably independent. However, it seems unlikely that experiencing PMS at one point during the cycle would influence pain and discomfort ratings at a different point in the cycle. For mood cycle changes, there is no evidence that they influence fluctuations in performance that can impact on work (Hyde, 1986) or school performance (Walsh, Bultz-Olsen, Leader & Cummins, 1981), nor that they would influence pain ratings. Furthermore, it is possible that the pain impacts on the mood and not visa versa. Therefore, this thesis will concentrate on dysmenorrhea only and exclude research relating to PMS and mood cycle changes.

Epidemiology

Researchers disagree on the prevalence of dysmenorrhea. Cox and Santirocco (1981) found that studies report a range of incidence from 3% to 84%. This depends on the type of sample chosen (e.g. a sample of women who come to a medical clinic) and on the diagnostic criteria (what they considered to be painful enough to call dysmenorrhea). Overall, studies which looked at a sample of women consulting a physician for this problem, found lower prevalence of dysmenorrhea than those studies which looked at a sample of women in the general population. This may be due to the finding that many women with moderate to severe dysmenorrhea never go to a doctor for this problem (White & Wildman, 1986). Large scale surveys have found that approximately 72% of women are affected mildly, and 5-19% severely (Merskey, 1986). The prevalence of dysmenorrhea decreases with age (Wood, Larsen & Williams, 1979). This may be a result of pregnancy (older women have a higher incidence of pregnancy). Having delivered a baby reduces the severity of dysmenorrhea and in many cases the pain disappears totally after the first birth (Morrison & Nicolls, 1981).

Dysmenorrhea is seen by some as the greatest cause of work absenteeism among women aside from the common cold (Cox & Santirocco 1981). Cox and Santirocco quote studies which found up to 140 million dollars annually lost in the U.S. due to this dysfunction, while White and Wildman (1986) quote studies which found 2 billion dollars lost each year. However, Morrison and Nicolls (1981) cite studies carried out in Europe that found a much lower rate of absenteeism. Regardless of the exact rate of absenteeism, researchers agree that it is a cause of many lost work hours.

Dysmenorrhea also affects women's productivity as well as their desire to participate in social and sexual pursuits (Andersch & Milsom, 1982). However, Rodin (1976) found that women who suffer from menstrual symptoms performed better, during menstruation, under stress, than non-symptomatic women and, also, better than women tested when they were not menstruating. Rodin explains this result in the context of attributions. Symptomatic women who are menstruating attributed their arousal to the menses. Likewise, Walsh et al. (1981) failed to find a debilitating effect of pain on test performance for university students. Perhaps dysmenorrhea affects women's desire to participate in social and sexual pursuits more than it affects their actual performance.

The effects of dysmenorrhea and cycle changes, in general, are a focus of debate among both scientists and politicians. On the one hand are people who advocate keeping women out of important positions due to their "raging hormonal influences" (e.g. Dr. Edgar Berman, physician to President Hubert Humphrey; Delaney, Lupton & Toth, 1976). On the other hand are those who claim that performance is not really decreased (e.g. Walsh et al., 1981) or that biological causes for fluctuating mood and performance are minimal and the expectations induced by cultural attitudes are the cause for the cyclical changes (e.g. Rodin, 1976). In addition, men also have cyclical changes (e.g. Ramey, 1972, cited in Hyde, 1986). Keeping this debate in mind, however, in the present study, we focus on individual, self-declared pain and discomfort problems and do not attempt to make policy statements.

Etiology

Many theories have been advanced regarding the etiology of dysmenorrhea, but the one that has received most experimental support is that dysmenorrhea is caused by the excessive production of endometrial prostaglandins (Danforth, 1982; Wynn, 1982). Prostaglandins (PG's) are smooth muscle contractants and probably produce a painful uterine contractility pattern or produce uterine ischemia (by causing endometrial arteriolar constriction). In addition, prostaglandins sensitize the pain receptors (Alvin & Litt, 1982). Although it has been found that certain hormones (e.g., progesterone), mechanical stimulation and tissue trauma can all trigger prostaglandin biosynthesis, it is unclear what exactly causes this excessive production. It is also unclear if the above explanation could account for mild dysmenorrhea, as uterine PG's have only been studied in severely dysmenorrheic women (Alvin & Litt, 1982).

Contributing Factors

Although the direct cause of the pain in dysmenorrhea is the release of PGs, it is yet unclear why in some women the uterus releases high levels of PG's (and, therefore, they have dysmenorrhea), while others do not. It is also unclear why the levels differ from month to month and from woman to woman. Stress is a possible mediator. Stress, brought about by emotions such as fear or extreme joy, or even events such as hot weather, can influence neuroendocrine secretion (McEwen, 1976). According to McEwen (1976) stress increases the flow of corticotrophine-releasing factor (CRF) which, in turn, increases secretion of ACTH (adrenocorticotrophic hormone) which then

causes the adrenal glands to secrete steroids. These steroids (e.g., progesterone) cause an excessive production of prostaglandins (Dawood, 1981).

Several biological, social and psychological factors may increase stress and thus cause painful menses. Additionally, stress and negative emotional arousal may increase pain by increasing constriction in the muscles and blood vessels (Nicassio, 1980). In addition, emotions such as fear and anxiety may increase the subjective experience of pain (Nicassio, 1980) and negative cognitions may exacerbate the pain experienced (Turk, Meichenbaum & Genest, 1983). Socio-cultural beliefs about effects of menstruation are also seen as influencing the report of dysmenorrhea and related symptoms (e.g., Ruble & Brooks-Gunn, 1982). The demographic and psychological factors which may influence the report of dysmenorrhea will be presented in this section.

Using an Australian sample of 2,343 women, Wood et al. (1979) found that married women had dysmenorrhea less often than single, separated and divorced women. Age and parity correlated with a lower incidence of dysmenorrhea and smoking correlated with a higher prevalence. The incidence of dysmenorrhea was also lower in women using oral contraceptives. In addition, incidence of depression, fears, suicidal thoughts and emotional difficulties was higher among women with dysmenorrhea than among women without painful menses.

Andersch and Milsom (1982) gave questionnaires to a sample of 596 women drawn from the population of 19 year old females residing in Gothenburg, Sweden. They, too, found that oral contraceptive users

had significantly less pain than non-users (however, 68% reported some degree of dysmenorrhea, 10% reported severe dysmenorrhea and 71 out of the 89 oral contraceptive users still used analgesics and or anti-spasmodics for the pain). Late menarche, shorter duration of menstrual flow, less bleeding and parity all correlated with lowered severity of dysmenorrhea. In addition, women who had mothers or sisters with dysmenorrhea had more severe dysmenorrhea than those without a family member with this disorder. In contradiction to Wood et al. (1979), Andersch and Milsom (1982) found that women who smoked had less severe dysmenorrhea.

Jordan and Meckler (1982) investigated the relationship between life change events and dysmenorrhea in 156 undergraduate nursing students. They found that life change scores correlated only modestly with the pain. The only important mediating social factor appeared to be the availability of a confidant. Women who had someone they felt they could confide in had lower correlations between life change and total menstrual distress scores than women who did not have a confidant. The number of supportive people, extent of contact with them and degree of closeness to them were not important moderators.

Paige (1973) investigated the influence of social and religious beliefs and expectations on menstrual discomfort. She found differences among the three religious groups investigated (Jews, Catholics and Protestants) in the variables that contribute to menstrual distress (measured on the Menstrual Distress Questionnaire - MDQ). For Jews, adherence to menstrual-social behaviors (e.g., abstaining from sex) correlated highly (0.60) with menstrual distress, while for Catholics, family and motherhood orientation, psychological

stress and general illness behaviors were main contributors (0.52, 0.46, 0.40). For Protestants, no correlation was above 0.32 (psychological stress).

Numerous investigators have hypothesized differences between dysmenorrheic and non-dysmenorrheic women on various personality questionnaires (e.g., Bloom, Shelton & Michaels, 1978; Heczey, 1977; Hirt, Kurtz & Ross, 1967; Iacono & Roberts, 1983). The scales used were typically the Minnesota Multiphasic Personality Inventory (MMPI), Personality Research Form (PRF), Tennessee Self Concept Scale (TSCS), State-Trait Anxiety Inventory (STAI) or the Locus of Control scale. The results found were contradictory; while several researchers found differences, others did not (Iacono & Roberts, 1983). There are several methodological problems that could explain the lack of consistency in the literature. These include: using small sample sizes, finding statistically significant differences that are not clinically significant, using select populations and making numerous comparisons without adjusting the probability level. In addition, Iacono and Roberts (1983) indicated that the studies used inappropriate statistics. They used t-tests which ignore shape and scatter of profiles, or correlational methods that ignore elevation. Iacono and Roberts used Cattell's profile similarity coefficient that considers scatter, shape and elevation, and found no differences on the 16PF between 31 severely dysmenorrheic and 31 non-dysmenorrheic women. They conclude, therefore, that no personality differences exist between dysmenorrheic and non-dysmenorrheic women.

An interesting study was performed by Marini (1979). He compared 26 women who were high MDS (menstrual distress symptom) complainers to 24 low MDS complainers on a variety of stress proneness and stress reaction measures. Although he used t-tests and ANOVAs, the results are still of interest. He found that the two groups differed significantly on heart rate, respiration rate and skin temperature during baseline. The high MDS complainers had a significant decrease in skin resistance during the critical menstrual phase, were more external on locus of control, exhibited a stronger Type A behavior pattern and scored higher on the MMPI neurotic triad. Therefore, Marini saw these women as being under chronic stress.

Aberger, Denney and Hutchings (1983) looked at college students' reactions to ischemic pain. They found that dysmenorrheic women did not differ from non-dysmenorrheic women on measures of pain threshold, tolerance or self-reported estimates of pain. They believed that others (e.g., Haman, 1944) who found a difference between dysmenorrheic and non-dysmenorrheic women did not control for phase of cycle. Women with spasmodic dysmenorrhea (pain begins with menses, also referred to as primary dysmenorrhea) and women without dysmenorrhea did not differ in terms of their use of kinds and amount of coping strategies.

In conclusion, increased stress and negative affect may increase the pain of dysmenorrhea and reduced stress and negative affect may decrease the pain. It was also found that dysmenorrhea was correlated with age, parity, menarche-age, duration of flow, having a family member with dysmenorrhea and religious beliefs. These variables may be a result of an unknown mediating variable or may contribute to the

severity of this disorder. Additionally, dysmenorrheic women are probably under chronic stress, which may be relieved somewhat by having a confidant. There is no evidence to support the conclusion that dysmenorrheic women have different personality traits, are more ready to report pain or have less effective coping strategies than non-dysmenorrheic women.

Treatment

Medical Treatment

Excessive production of PGs is believed to be the cause of the pain in dysmenorrhea, and prostaglandin synthetase is an enzyme that is involved in PG synthesis, therefore, prostaglandin synthetase inhibitors or drugs that are prostaglandin antagonists are used to alleviate the pain. These are usually non-steroidal anti-inflammatory drugs (NSAIDs). NSAIDs are effective in 66-90% of women (Chan, 1983a; Henzle, 1980). Often, if the woman is also interested in birth control, she will be given an oral contraceptive. This drug inhibits ovulation and reduces the production of PGs and the menstrual fluid volume by suppressing the growth of the uterine lining (Chan, 1983a, 1983b). In double blind cross-over design studies, oral contraceptives have been found to be effective for 50-59% of the women treated (Henzle, 1980). With mild cases of dysmenorrhea, analgesic, sedative or anti-spasmodic drugs may be used (Danforth, 1982; Wynn, 1982).

Oral contraceptive use has many side-effects and has been found to be implicated in many diseases (cardiovascular changes, tumors in the genitalia or liver and pituitary dysfunction [Badawy, Rebescher,

Kohn, Wolfe & Oates, 1983]). Therefore, many physicians prefer not to prescribe them to a woman who has other means of birth control. The NSAIDs have less severe side effects and, when taken for one or two days a month, are believed to be harmless. However, their effects are not uterine specific; they suppress total body PG synthesis and, if taken in large doses, are potentially toxic (Chan, 1983a). They are also not recommended for use by women who have gastrointestinal ulcers or a history of a bronchospastic reaction after use of aspirin (Dawood, 1985). In addition, prostaglandin elevations in menstrual fluid are not seen in all patients with dysmenorrhea (Demers, Hahn & McGuire, 1985). Therefore, Chan (1983b) warns that PG synthetase inhibitors "should be used judiciously" (p. 249).

Alternative medical treatments are acupuncture, acupressure and transcutaneous electrical nerve stimulation (TENS). These approaches have not been widely used, however they hold promise (e.g., Mannheimer & Whalen, 1985; Neighbors, Clelland, Jackson, Bergman & Orr, 1987).

Psychological Treatment

Although dysmenorrhea is a physiological problem, it also influences and is influenced by psychological factors (e.g., Dawood, 1985). In addition, not all women suffering from dysmenorrhea benefit from NSAIDs and, for some, their use is contraindicated (Dawood, 1985). One possible explanation for the influence of psychological factors on dysmenorrhea is presented in Melzaqk's Gate Control Theory. Melzack and Wall (1982) postulated a "gating" mechanism in the substantia gelatinosa (in the spinal cord). According to this theory, information on pain, which is transmitted through "afferent fibers to spinal cord transmission (T) cells is modulated by a spinal gating

mechanism in the dorsal horn....The spinal gating mechanism is influenced by nerve impulses that descend from the brain...A specialized system of large-diameter, rapidly conducting fibers (the central control trigger) activates selective cognitive processes that then influence, by way of descending fibers, the modulating properties of the spinal gating mechanism" (p. 226-227). In addition, as stated earlier (contributing factors section), stress can increase the production of prostaglandins and, therefore, reduction of stress can reduce this production. Therefore, psychological approaches have been developed to help women with painful menses. Examples of such psychological treatment approaches are: biofeedback, relaxation, systematic desensitization, cognitive behavior therapy, hypnotherapy and Lamaze. A comprehensive review of the research into the effectiveness of each of these methods will follow. Relaxation and biofeedback are the two most widely used psychological treatment approaches for dysmenorrhea; therefore, they will be presented first.

Relaxation and biofeedback. Relaxation and muscle biofeedback have a similar rationale (Heczey, 1980). The rationale is that by relieving tension in the muscles, this will generalize to the uterus and, thus, reduce the contractions and, consequently, the pain. Reduced tension should also reduce the fear and consequently the pain (Ben-Menachem, 1980). Skin temperature biofeedback is slightly different from relaxation and muscle biofeedback (Dietvorst & Osborne, 1978). Skin temperature is assumed to be an indication of sympathetic activation. According to Dietvorst and Osborne (1978) the higher the temperature, the lower the arousal. Therefore, teaching women to warm

their hands or pelvic area will increase their level of relaxation. In addition, it may help by teaching women to vasodilate. This will increase the blood flow and, thus, reduce the ischemia in the uterus (Sedlacek & Heczey, 1977).

Muscle biofeedback, skin temperature biofeedback and relaxation seem to operate through similar mechanisms. Relaxation is usually the first step in biofeedback treatment and does not necessitate using expensive machinery or specially designed rooms. It can be easily practiced at home between sessions. Therefore, it is important to assess the advantage, to dysmenorrheic women, of adding biofeedback to a relaxation regimen.

Seven studies were performed using biofeedback without comparing it to relaxation. Only two studies used a control group (Breckenridge, 1981; Russ, 1977). Breckenridge (1981) found an effect for hand-warming biofeedback, while Russ (1977) did not. The other five studies are uncontrolled single or multiple case studies (Balick, Elfner, May & Moore, 1982; Dietvorst & Osborne, 1978; Hart, Mathisen & Prater, 1981; Sedlacek & Heczey, 1977; Tubbs & Garnahan, 1976). These studies found that biofeedback was helpful in reducing the discomfort of dysmenorrhea.

The studies mentioned above did not examine relaxation and, thus, cannot address the question of the efficacy of relaxation or the superiority of biofeedback over and above the effect of relaxation. The two studies that used relaxation without biofeedback can provide information about the utility of relaxation, but not about the comparative effects of relaxation and biofeedback. These studies show mixed support for using relaxation with dysmenorrheic women (Ben-

Menachem, 1980; Rosenthal, 1978). Ben-Menachem conducted an uncontrolled study that found that relaxation was beneficial, while Rosenthal, using a placebo-control group design, found that it was no better than systematic-desensitization or a non-directive treatment.

To answer the question concerning the comparative effects of biofeedback and relaxation, the three studies which combined and compared these treatment approaches need to be examined. Using toe temperature feedback, Polson (1981) found that relaxation, with or without biofeedback, reduced menstrual symptoms, whereas biofeedback alone did not. However, this study was criticized (along with several of the studies reviewed earlier) for its use of skin temperature at a site remote from the pain source, rendering biofeedback minimally effective to reduce the pain (Denney & Gerrard, 1981). Denney and Gerrard suggest using vaginal temperature biofeedback or abdominal muscle biofeedback.

The two remaining studies comparing relaxation and biofeedback used vaginal temperature (Heczey, 1980) or abdominal muscle biofeedback (Bennink, Hulst & Benthem, 1982) and found that the combination of biofeedback and relaxation was superior to relaxation alone. Heczey also found that relaxation was superior to a control group while Bennink et al. (1982) did not. Biofeedback alone was not examined.

Therefore, it appears that traditional relaxation (autogenic training or progressive relaxation), that is not specific to the menstrual discomfort area, is not as effective as the combination of specific biofeedback and general relaxation, and is not always

superior to a control group. However, just as specific biofeedback was found to be effective in all studies that examined it, whereas general biofeedback was not always effective (e.g. Ballick et al., 1982), it is possible that specific relaxation will be superior to general relaxation. Specific relaxation would be general relaxation with additional time spent on relaxing the abdominal muscles. In addition, the two studies which found relaxation to be beneficial (Heczey, 1980; Polson, 1981) used autogenic relaxation while the two studies that did not find relaxation effective (Bennink et al., 1982; Rosenthal 1978) used muscle relaxation. Perhaps autogenic relaxation is more effective for this population.

Systematic-desensitization. Systematic-desensitization (SD), like relaxation and biofeedback, attempts to reduce the pain through relaxation. However, unlike relaxation and biofeedback, the imagery component in SD alleviates the anxiety associated with the pain, often encourages coping behavior and, thus, further reduces the pain. In addition, the imagery can serve as a cue to initiate relaxation. Seven studies used a modification of SD for dysmenorrheic women. Two of these studies were case studies (Mullen, 1968; Tasto & Chesney, 1974), while five were controlled studies (Chesney & Tasto, 1975; Cox & Meyer, 1978; Mullen, 1971, cited in Denney & Gerrard, 1981; Reich, 1973; Rosenthal, 1978). Except for Rosenthal (1978), who found that SD was not superior to relaxation or a non-directive treatment, all the studies found that SD helped relieve the pain of dysmenorrhea. Therefore, strengthening relaxation by adding imagery was found to be beneficial for dysmenorrheic women.

Cognitive-behavior therapy. Nicassio (1980) suggests using multimodal behavior therapy with dysmenorrheic women, targeting the physiological arousal with relaxation and/or biofeedback, the negative affect with systematic desensitization or cue-controlled relaxation or reappraisal, and the cognitions with education and specific pain control strategies such as attention diversion. Three studies were conducted using cognitive behavioral techniques (DeWitt, 1981; Duson, 1977; Quillen & Denney, 1982).

Duson used relaxation-desensitization with and without cognitive restructuring of the negative self-statements. She found that both treatments were slightly better than a no-treatment control group and there was no difference between the group receiving relaxation only and the one receiving relaxation and cognitive restructuring. Therefore, Duson found the somatic treatment to be as effective as the combined cognitive and somatic treatment.

Quillen and Denney used Anxiety Management Training (AMT), a modification of SD for general anxiety, which combines cognitive and somatic elements. AMT also encourages the client to take a more active role in treatment than she does in SD. The relaxation taught in their study was specific to dysmenorrheic women and included, for example, concentration on the muscles of the sub-abdomen as well as imagery of a warm liquid flowing over their discomfort area. Quillen and Denney found that the treatment was successful with dysmenorrheic women. However, they did not compare their treatment to a cognitive-only or a somatic-only treatment.

DeWitt found that although group treatment reduced menstrual distress scores from pre- to post-treatment, there were no differences

between a control group and two treatment groups. One treatment group used a combination of rational emotive therapy (RET), assertiveness training (AT) and historical review, and the second treatment group used a combination of relaxation training, biofeedback and exercise. The lack of significant findings in this study may be due to the small number of women in the group (5). Additionally, the cognitive treatment group did not include cognitive restructuring, coping statements or distraction, all of which have been found to be effective for pain control (e.g. Rybstein-Blinchik, 1979; Turk et al. 1983).

The main treatment approaches for dysmenorrhea were reviewed above. The following is a comprehensive review of several of the less commonly used therapies.

Other psychological approaches. Several studies were found that utilized dynamic psychotherapy, hypnotherapy or hypnoanalysis for dysmenorrhea. According to them, the menses remind the woman of loss of a penis (or a child) and this causes a feeling of hostility and impairment as well as memory deficits and unreliable actions. It is a mark of maturation and emphasizes conflicts over growing up and over accepting the female role (Astrachan, 1981; Cox & Santirocco, 1981). In addition, these authors state that dysmenorrhea results from tightening up of the muscles of the uterus which is a result of underlying conflicts over femininity (Denney & Gerrard, 1981). Hypnotherapy is assumed to result in muscle relaxation and help the woman resolve her conflicts. In addition, hypnotherapy may raise the pain threshold (Kroger & Freed, 1943). No controlled treatment

studies using these approaches were found in the literature. Therefore, the uncontrolled studies that were conducted will be reviewed. Dynamic psychotherapy was tried successfully in one study (Astrachan, 1981). Hypnotic suggestions have been used successfully in three studies (Dorcus & Kirkner, 1948; Kroger & Freed, 1943; Leckie, 1964, cited in Denney & Gerrard, 1981). Hypno-analysis and age regression were tried in five cases (Kroger & Freed, 1943). Two were helped using this treatment.

The Lamaze method was used for primary dysmenorrhea in two studies (Fleischauer, 1977 and House, 1969 both cited in Lewis, Wasserman, Denney & Gerrard, 1983). Again, both are uncontrolled multiple case studies. The Lamaze technique was applied to dysmenorrhea because of the similarity of the pain to labor pain. Lamaze includes an explanation of the physiology of menstruation, relaxation training, distraction of attention (to breathing and visual stimuli) and exercises to relieve pelvic congestion prior to menses (Denney & Gerrard, 1981).

None of the studies examining dynamic psychotherapy, hypnotherapy, hypnoanalysis or Lamaze were controlled studies. Therefore, it is difficult to know if these approaches are beneficial or not.

Others advocate using education to reduce the fears, misinformation and inhibitions surrounding menstruation in order to relieve the pain (Abraham, 1978; Fraser, 1980; Jones & Jones, 1981; all cited in Lewis et al., 1983, Asso, 1983). Education has been included in many of the studies cited above, but was never examined by itself.

Summary. In summary, teaching relaxation is effective in reducing pain and interference scores for dysmenorrheic women. Adding biofeedback to relaxation results in slightly more benefit than general relaxation alone. Tailoring relaxation to dysmenorrhea by concentrating on discomfort areas is beneficial as well as may be superior to general relaxation; however, these two forms of relaxation have not been compared.

Only one study examined a cognitive treatment of dysmenorrhea. This study found no difference between a treatment comprised of RET, AT and historical review, and a control group. However, the study did not teach cognitive control procedures or use cognitive restructuring nor did it involve a practice component. In addition, the lack of significant findings may be due to the small sample size (5). Therefore, it is still unclear if dysmenorrheic women could benefit from a purely cognitive treatment.

In addition, combining cognitive and somatic elements was beneficial compared to control groups. Although combining cognitive and somatic elements is theoretically believed to be superior to either treatment alone (e.g., Nicassio, 1980), the results from one study which compared relaxation/desensitization and cognitive restructuring to relaxation/desensitization alone (Duson, 1977) did not support the superiority for combining the two approaches. No other studies were found that compared a combined treatments for dysmenorrhea (cognitive and somatic) to a cognitive or a somatic treatment. Further research is needed to investigate the benefit to women of engaging in a cognitive treatment as well as the benefit of combining cognitive and somatic elements.

Matching Treatment to Expectations

The first goal of the thesis was to find an effective psychological treatment for dysmenorrhea. The literature relevant to that goal was presented in the previous section. Research relevant to the second goal, the matching hypothesis, will be presented in this section. Therefore, studies examining expectations and their effects on treatment process, compliance and outcome will be reviewed.

Goldstein (1962) classified expectations into two categories: (a) expectations as to the client's and therapist's roles in treatment and (b) expectations of outcome of the therapy. Support for this distinction comes from Friedlander (1982) who found that these two types of expectations were not correlated before counseling. Although these two distinct classes of events were researched separately, they share some common theoretical underpinnings. These are reviewed next.

The "hypothesis theory" (Goldstein, 1960) states that hypotheses (expectations) held by the individual will be aroused and confirmed by information in the environment. A large amount of disconfirming information is necessary to dispute hypotheses that are strongly held. These beliefs (expectations) are antecedents of attitudes which lead to intentions and behavior (Quinn, 1979). Furthermore, Rotter, Chance and Phares (1972) in their social learning theory, state that expectation is anticipation of goals or reinforcements. Expectations are determined by previous experience and influence behavior. If the individual has no prior experience with the situation, generalized past expectancies will weigh heavily, whereas specific expectancies will be important if he/she has had previous exposure to the situation.

Locus of control is an important mediator in the effect of expectancies in that individuals who perceive that obtaining reinforcement is within their control will exhibit a stronger expectation-behavior correlation than those who feel reinforcement is beyond their control (Rotter et al., 1972). Also, as stated in the "hypothesis theory", expectations based on several events are more resistant to change than those based on a single event. Therefore, manipulating weaker expectations (e.g., by providing positive feedback) can lead to a benign cycle where the patient tries behaviors previously avoided, and, thus, changes strongly held expectations.

Lick and Bootzin (1975) and Rosen (1976) believe that expectations produce cognitive changes and encourage the subject to engage in reality testing, for example, to encounter the conditioned stimulus (fear object). This leads to change, for example, to habituation and reduction of the phobia. Additionally, expectations may increase relaxation; this aids therapy.

Expectations may result from prior experience with treatment (medical or psychological), the nature of the referral (e.g. explicit or implicit messages given with the referral), motivation for cure or therapist's expectations which are communicated to the patient.

Expectations of Content

Expectations of therapist and client behaviors are inseparable from expectations of process and content because it is the therapist and client behaviors that in part determine the process. Therefore, role expectations and process/content expectations are reviewed jointly in the present section.

Strong (1968) compared the counseling process to opinion change in social psychology. Accordingly, if the patient's expectations are not met, he/she is in a state of dissonance. This can be reduced by: (a) attempting to change the counselor's opinion/therapy, (b) devaluating the importance of the issue, (c) discrediting the therapist, (d) the client changing his/her opinion. The client came to treatment, therefore it is unlikely he/she will reduce the importance of his/her problem. Therefore, if the therapist does not wish to change the therapy, discrepancies between expectations and role reality will only lead to negative effects if the client is able to discredit the therapist or devalue the issue. Maintaining therapist trustworthiness, expertise and attractiveness will reduce this possibility, and lead to client change.

Duckro, Beal and George (1979) cite Kelly's theory as one of the first works in this area. According to Kelly, clients have pre-conceived notions about what will happen in therapy. If they are disconfirmed, the client will be confused or disappointed.

Garfield and Wolpin (1963) found that there was a large variability in treatment content expectations (e.g., advice giving) among outpatients coming to therapy for the first time. Patients also differ on expectations as to the therapist role. Goldstein (1960) found that patients expect therapists to behave in one of three typical roles: nurturant (giving, guiding, warm), model (neither protective nor critical) or critic (analytical and critical). When therapist's behavior confirms subjects' expectations, therapists are rated higher than when their behavior disconfirms the expectations (Price & Iversen, 1969).

Two major reviews were performed on the effect of disconfirming expectations. The first, by Goldstein in 1962, concluded that disconfirmation of client-held, therapist role expectations can lead to a negative effect. The studies Goldstein reviewed found that the larger the difference between expectations and reality, the more the therapeutic relationship is strained and the higher the drop-out rate unless the patient changes his/her expectancies to be closer to the reality.

Duckro et al. (1979) conducted the second review. Their conclusions are less enthusiastic: "a comprehensive review of the available literature suggests considerable ambiguity regarding the validity of the hypothesis that disconfirmed role expectations result in negative consequences. Research since 1962 has not clearly supported the enthusiastic inferences drawn from the early speculative and experimental literature" (p. 269). They cite several methodological reasons for this ambiguity, e.g., using subjective measures of role expectations.

Although the early literature suffered from these shortcomings, recent studies controlled for many of these problems (e.g., Persson & Nordlund, 1983). In addition, some of the criticisms raised by Duckro et al. (1979) were not found to adversely affect research. For example, the belief that analogue subjects (i.e., undergraduate students) have different expectations than therapy clients did not receive support in the study conducted by Hardin and Subich (1985). They found no significant differences in expectations from a first counseling session between student non-clients, student-clients and

non-student clients. Similarly, Collins and Hyer (1986) dispute the belief that patient-rated outcomes are necessarily biased. They found a correlation between patient-rated expectations and outcome at three months and between expectations and significant-other outcome rating.

Expectations both influence behavior and are influenced by it. Frank (1968a, 1968b) reported that patients given a placebo showed most of their improvement (in symptom reduction and mood elevation) after told they would receive a treatment, but before actually receiving it. In addition, using an analogue design, Ammerman and Hersen (1986) found that subjects who were told to expect a "cold, standoffish" confederate, exhibited less effective social interaction during a role-play than subjects expecting a "warm, friendly" confederate. On the other hand, discrepancies between expectations and reality serve to modify expectations. For example, Ammerman and Hersen (1986) report finding that ratings of expectations given after an interaction with a neutral confederate were less extreme than those given by subjects who did not engage in the role-play.

Discrepancies between expectations and reality also increase the risk for treatment drop-out (e.g. Baekland & Lundwall, 1975; Heitler, 1976; Orne & Wender, 1968). For example, Heine and Trosman (1960) found that among patients referred for psychiatric treatment, significantly more continued in treatment among those whose expectations of "means of reaching goal in treatment" were "active collaborative" than among those expecting "passive cooperative" behavior on their part. Jacobs, Charles, Jacobs, Weinstein and Mann (1972) found that over 1/3 of the patients who drop out of therapy do so after the first interview. Therefore, several therapists

concentrated their efforts on preparing clients for this session. For example, Heitler (1976) helped clients realize they would not be asked questions or given advice.

Preparation for therapy was found to be beneficial. Heitler (1976) reviewed the research on preparing lower-class patients for analytic therapy and found a beneficial effect for preparation. Heilbrun (1972) found that briefing clients on therapist behavior in the initial interview reduced drop-out rates for low counseling-ready women and increased satisfaction for high counseling-ready women. No effects were found for males.

For clients who remain in therapy, Martin, Sterne and Hunter (1976) found little difference in rated satisfaction from treatment between client-therapist dyads who rated expectations of therapist behavior similarly and those that rated it differently. Perhaps this is due to a convergence that occurs in treatment between client and therapist ratings. Accordingly, Benbenishty and Schul (1987) found that clients' and therapists' expectations of role behaviors and content become more similar as therapy progresses. Clients' ratings of their expectations from sessions and their perceived reality become closer as well (Benbenishty, 1987).

Examining the effect of disconfirmed expectations on outcome, Persson and Nordlund (1983) investigated phobic patients receiving medication and information alone, or in combination with prolonged exposure in-vivo, dynamic therapy or relaxation therapy. They found that matching patient pre-therapy expectations of therapist behavior and treatment content to therapy resulted in more benefit from therapy, as rated by an independent rater.

In conclusion, disconfirmed expectations often lead to treatment dropout. For the clients who stay, their expectations tend to shift in the direction of reality (Goldstein, 1962). Although there is little difference in satisfaction between those whose initial expectations match their therapists' and those whose initial expectations do not, client behavior in the sessions is influenced by their expectations and disconfirmed expectations lead to less benefit from therapy.

Expectations for Outcome

The studies investigating expectation of outcome far outnumber those pertaining to expectation of content. Although not directly relevant to this thesis, the conclusions from these studies may be generalized to the treatment content expectation literature.

Goldstein (1962) reviewed the literature on outcome expectations and concluded: "the theoretical and experimental material which has been presented all rather clearly suggests that the participant's expectations play a significant role in the psychotherapeutic interaction, demonstrably accounting for a portion of the patient improvement which takes place" (p. 79).

However, Wilkins reviewed the literature in 1973 (1973b) and found it was inconsistent. He attributed this inconsistency to several methodological shortcomings, and concluded that there was no support for the use of expectancies to explain outcome. One explanation Wilkins offerd for the studies that found a relationship between expectations and outcome is that client expectations may operate through changes in therapists' expectations. Accordingly, Wilkins (1973a) found that in studies reporting an association,

therapists were not blind to condition, while in studies that did not find such an association, they were. Therefore, he concludes that: "the client's communication of his expectancies may affect therapeutic outcome indirectly by influencing the behavior of the therapist" (p. 188). In support of this view, Rosenthal and Fode (1960) and Rosenthal, Friedman, Johnson, Fode, White and Viken (1960, both cited in Goldstein, 1962) found that even when therapists read standard instructions, they biased the subject's behavior in the direction of their expectations. Additionally, using a heterogeneous psychiatric population, subjective (MMPI) and objective (blind raters) measures, Martin and Sterne (1975) found a significant correlation between factor scores of therapist expectations and improvement and not between patient expectations and improvement.

Research since 1973 has improved on many of the points raised by Wilkins (1973b), and, consequently, the anticipated correlation between expectations and outcome has been supported (Bradley & McCarne, 1981; Schwartz; Hadley & Strupp, 1978). For example, using blind raters and objective measures (blind ratings of approach, pulse rate and finger-sweat print), Borkovec (1972) found an effect for positive expectancies for snake phobic subjects on behavioral (but not physiological) measures. Similarly, Rosen (1974) found an effect for manipulated therapy suggestions using blind experimenters.

Using analogue subjects, the degree of experienced discomfort, as displayed on the dependent variables, may mediate the effect of expectations. For example, Borkovec (1973) found that studies reporting an expectancy effect (using analogue subjects) employed low-fear subjects while studies with high-fear subjects found no effect.

Expectations may also operate through demand characteristics. Subjects may respond on outcome measures according to how they expect they should behave (Lick & Bootzin, 1975). A study by DeGood, Elkin, Lessin and Valle (1977) supports the demand-characteristic explanation. They found that subjects who had prior knowledge of alpha-wave production, and, thus, presumably expected to experience certain sensations, reported more "alpha-related" experiences in an alpha-enhancement stage than in a suppression stage, and more than those subjects who did not have this knowledge.

Expectations may increase motivation to participate fully and, thus, result in more improvement. Shaw and Blanchard (1983) manipulated expectancies by telling one stress management group that the treatment was very successful and another that it was experimental. They measured expectations and found that the manipulation worked. Using self-report (e.g. State-Trait Anxiety Inventory) and objective (e.g. heart rate) measures, they found that the positive demand group practiced more at home between sessions and reduced stress on subjective and objective measures more than the other group. Persson (1976), using blind raters and objective measures, found that patients with anxiety-tension states, treated with medication were slightly more improved if they originally expected to be improved greatly than if they expected slight or no improvement.

Drop-out rates have been examined in expectations of content. They are also correlated with expectation of outcome. Sanavio (1981) examined inherent expectancies of biofeedback in one experiment and

manipulated expectancies in a second and found no interaction with the ability of non-clinical high-school girls to raise and lower finger temperature. However, there was a large difference in drop-out rate between the subjects with high and low expectancies. The therapist was not blind to condition in this research. Piper, Wogan and Getter (1972) also found that early terminators had lower pre-therapy outcome-expectancy ratings than those remaining in therapy.

In conclusion, outcome expectations influence clients' behavior. Increased expectations motivate clients to remain in therapy and participate more fully. However, it is important to separate the effect of expectations from that of demand characteristics.

Hypotheses

The research on psychological treatment of dysmenorrhea indicates that somatic treatment approaches may be beneficial. Only one study utilized a cognitive treatment (RET, assertiveness training and education) and compared it with a somatically-based treatment (biofeedback, relaxation and exercise) for 15 dysmenorrheic women (DeWitt, 198[illegible]). Perhaps due to the small sample size, no differences were found between these groups and a control group, nor were there any differences between the two approaches. In addition, the cognitive treatment did not include specific pain-related coping skills (e.g. distraction) and the somatic treatment did not include specific relaxation. Following Nicassio's (1980) suggestion to use multimodal behavior therapy with dysmenorrheic women, targeting the physiological arousal, negative affect and cognitions, a combined treatment was used and compared to the cognitive treatment and the somatic treatment.

Therefore, the first two hypotheses were:

1. Dysmenorrheic women given a cognitive or somatic treatment will improve more than dysmenorrheic women in a wait-list control group.
2. Dysmenorrheic women given a combined treatment will improve more than dysmenorrheic women given a somatic-only or cognitive-only treatment.

The expectations literature leads to the conclusion that disconfirmed expectations may result in less benefit from treatment than confirmed expectations. This led to the third hypothesis:

3. Dysmenorrheic women who are given a treatment which matches their expectations (cognitive or somatic) will experience a greater reduction in pain and menstrual interference than dysmenorrheic women who are mismatched.

Before the hypotheses were to be tested, it was necessary to investigate the availability and characteristics of the target population in London. This was undertaken in Study 1. In addition, a treatment-expectations questionnaire was not available and, thus, needed to be designed; this was done in Study 2. Study 3 drew upon the results of the previous two studies in testing the hypotheses.

STUDY 1

Researchers disagree on the prevalence of dysmenorrhea (see general introduction). Therefore, Study 1 was performed to assess the incidence rate in the target population, as well as the need for a non-pharmacological and non-surgical treatment for dysmenorrhea. In addition, items relating to characteristics which were found in past research to influence or be influenced by pain in general (e.g., social activity), treatment in general (e.g., self-treatment), pain of dysmenorrhea (e.g. menarche-age) or treatment of pain of dysmenorrhea (e.g., physician diagnosis), were assessed. These results were later used in designing the treatment and the questionnaires for Study 3.

Method

Subjects

The subjects were 210 female students in an undergraduate psychology course at the University of Western Ontario. The age range was 19 to 56 with 72% between the ages of 19 and 24. Participation in the study was voluntary.

Measures

The women responded to a questionnaire which contained the following measures: classification of time of pain, pain intensity, time of cycle, interference in daily life, physician diagnosis and treatment, self-treatment, interest in non-medical treatment, parity, age, age at menarche, regularity of menses, smoking, having a friend or family member with dysmenorrhea, weight, and use of a method of birth control (see Appendix A).

Classification. This variable was measured by asking women if they felt pain before menstruation, during, both before and during, or pelvic pain unrelated to menstruation.

Pain. Two 100 mm visual analogue scales were used for each type of pain (before, during, pelvic). One scale requested women to rate their worst pain ever and the other asked them to rate their average pain. On one end of each scale was written: "no pain at all" and at the other end was written: "the worst possible pain".

Time of cycle. This consisted of one question asking about the part of the menstrual cycle the woman was in when answering the questionnaire.

Interference. Interference was measured using four separate questions: (a) number of days missed from school or work because of the pain (ranged from "none at all" to "over 3 days a month"), (b) number of hours slept more or less than usual because of the pain (ranged from "over four hours more" to "over four hours less"), (c) the degree to which the pain affected productivity (scored on a 4-point scale ranging from "none" to "extremely reduces it"), and (d) the degree it affected social life (also scored on a four point scale from "none" to "extremely reduces it").

Physician diagnosis and treatment. Subjects were asked if they had consulted a physician. If they had, they were asked to indicate what diagnosis they received, what treatment was prescribed and the degree to which each treatment helped (on a four point scale: "after doing it my pain was the same as before", "less than before", "much less than before", "gone").

Self treatment. A list of coping methods was developed after in-depth interviews with several dysmenorrheic women, and examination of the treatment literature. These coping methods were presented to the women and they were requested to indicate those they used and to rate the degree to which each coping method they used helped them alleviate the pain (on the same 4-point scale as for treatment prescribed by the physician).

Interest in treatment that did not involve drugs or surgery. Women were requested to indicate if they were interested in such a treatment, and, if so, how many hours they would devote to the treatment.

Parity. Women were asked if they had carried a baby to term or not.

Age and age at menarche. Participants were asked their age and their age when they first started to menstruate.

Regularity of menses. Women were asked if their periods were regular, and if so, how often they had them.

Smoking. One question asking if they smoked, and, if so, how many cigarettes a day they smoked was included in the questionnaire.

Knowledge of other dysmenorrheic women. Participants were asked to indicate if a friend or family member had pain before or during menstruation.

Weight. One question asking them to indicate if they were under-weight, over-weight or neither was included in the questionnaire.

Birth control. Women were asked if they were using a birth control method, and, if so to indicate which one it was, and if they felt it had affected their pain.

Procedure

During a break in the class, the lecturer asked the men to leave and the women to remain. The researcher then explained the nature of the questionnaire, emphasizing it was voluntary and anonymous. The questionnaire was distributed and the visual analogue scale explained. Seven women left the class and the remaining 210 responded to the questionnaire. Two weeks later, a summary of the main findings was prepared by the researcher and presented to the class by the lecturer. This summary included information on the number of women in each pain category and the average degree of pain as well as the coping styles used by the women.

Results

On the questionnaire, women indicated if they suffered pain before, during, both before and during menses, or pelvic pain unrelated to menstruation. Only one woman had pelvic pain unrelated to menstruation, 25 had no pain at all, and the remaining 184 had pain related to menses (18 before, 45 during and 121 before and during).

In Table 1, the number of women at each pain level is presented. Pain levels refer to the pain ratings of the average period. It is interesting to note that in both the group suffering from pain before and in the group suffering from pain during menses, a majority of the women have pain that is rated as less than 40 mm on the 100 mm scale, whereas for the women who have pain both before and during menses, the distribution is similar to a normal distribution with 21% having pain between 41 and 50 mm and the numbers dropping off as the pain is higher than 50 or lower than 41.

Table 1

Number of Women in Each Pain Level

pain level (in mm)	pain before and during menses group N	%	pain during menses group N	%	pain before menses group N	%
1-10	1	1	6	13	6	33
11-20	14	11	9	20	3	17
21-30	18	15	9	20	4	22
31-40	11	9	4	9	3	17
41-50	25	21	3	7	0	0
51-60	18	15	4	9	1	5
61-70	14	11	3	7	0	0
71-80	10	8	1	2	0	0
81-90	7	6	4	9	0	0
91-100	2	2	1	2	1	5
Number of missing observations	1	1	1	2	0	0
Total	121		45		18	

The visual analogue scale on which the pain was rated ranges from 0 mm ("no pain at all") to 100 mm ("the worst possible pain"), with 50 mm as the midpoint. Therefore, a cutoff of 60 mm, which represents higher than average pain, was chosen. In this study, 43 of 121 women (23%) have pain over 60 mm.

In Table 2, information on smoking, use of contraception, parity and time of cycle when answering the questionnaire is presented. Number of women who used oral contraceptives, smoked, had a pregnancy or delivered a baby were proportionately distributed between low levels of pain (less than 60 mm) and high levels of pain (over 60 mm). Among women who experienced pain only during menses, there was a tendency for menstruating women to rate the pain as severe and for those who were 1-5 days post menses to rate it as less severe. This finding was reversed among women with pain before and during menses. Among this group, women who were menstruating rated the pain as less severe than women who were not menstruating. This finding underscores the importance of measuring pain at the time it is experienced.

Table 3 provides details of the prescriptions given to women who rated their pain (of their average period) as over 60 mm. Most were given prescription medication (usually non-steroidal anti-inflammatory drugs called NSAIDs). Not all the women receiving these medications found them helpful. For 16 of 31 women it "helped a lot" or the pain was gone, but for the remaining 11 women, it only reduced it a little, and for 4 women, it did not help at all. The second most popular prescription was exercise, it helped three out of the five women to whom it was prescribed.

Table 2

Characteristics of Women with Painful Menstruation

	no pain group		pain before and during group				pain during menses group				pain before menses group			
			pain under 60mm		pain over 60mm		pain under 60mm		pain over 60mm		pain under 60mm		pain over 60mm	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
birth control:														
IUD	0	0	1	1	1	3	0	0	0	0	1	6	0	0
pill	8	32	4	4	12	36	1	51	5	56	7	41	0	0
other	0	0	2	2	0	0	1	3	0	0	1	6	0	0
smoking	2	8	23	26	12	36	6	17	0	0	5	29	1	100
pregnant, not carried to term	0	0	2	2	1	3	4	11	0	0	0	0	0	0
pregnant, carried to term	1	4	8	9	2	6	0	0	1	11	2	12	0	0
time of cycle:	Not measured													
menstruating			17	19	2	6	6	17	3	33	1	6	0	0
1-5 days post			14	16	6	18	10	29	0	0	4	24	0	0
6-15 days post			26	30	17	52	9	26	2	22	5	29	0	0
16-23 days post			18	21	12	36	9	26	2	22	5	29	0	0
24 or more post			5	6	2	6	3	9	1	11	2	12	1	100
Total	25		87		33		35		9		17		1	

Table 3

Number of Women who Received Each Prescription, and the Degree of Pain Reduction, Among Those with Pain Over 60mm

prescription	pain before and during group				pain during menses group				pain before menses group			
	N	much less	less	same	N	much less	less	same	N	much less	less	same
medication	26	13	11	2	4	3	0	1	1	0	0	1
surgery	1	0	0	1	0				0			
exercise	4	1	2	1	1	0	0	1	0			
diet	3	0	1	2	0				0			
vitamins	0				1	0	0	1	0			
heat	2	0	1	1	0				0			
beef uterus	1	0	0	1	0				0			
relaxation	1	0	0	1	0				0			
Total saw a physician	28*				4				1			

*Some women received more than one prescription

Table 4 describes the coping methods used by women who rated their pain (of their average period) as over 60 mm. The two most popular methods were taking aspirin and prescription medication. The prescription medications seem to help more than does the aspirin. Going to bed and exercising were also helpful for many of the women. Distraction was only tried by eight women, but six of them found it helpful. Meditation was not tried by anyone.

The results presented in Table 5 indicate that most women who rate their pain as exceeding 60 mm find that it interferes with social life, productivity, sleep patterns and a large proportion even miss a day a month from school or work activities.

Of the total sample, 120 women expressed an interest in non-pharmacological treatment for their pain. Of those women interested in treatment, only 15 said they would devote more than six hours to treatment. Among women who rated the average pain of their period over 60 mm, 30 (70%) expressed an interest in treatment.

Table 4

Coping Strategies Used by Women with Pain Over 60 mm. and the Degree They Reduced Their Pain

coping method	pain before and during menses group				pain during menses group				pain before menses group			
	N	much less	less	same	N	much less	less	same	N	much less	less	same
aspirin	21	4	15	2	5	1	4	0	1	0	0	1
prescription medication	21	10	10	1	3	1	1	1	1	0	0	1
exercise	9	4	3	2	1	0	1	0	0			
meditation	0				0				0			
talk to a friend	3	0	2	1	1	0	0	1	0			
go to bed	20	1	14	5	5	1	3	1	1	0	1	0
distraction	5	1	3	1	3	0	2	1	0			
worry	2	0	0	2	0				0			
other	3	2	0	1	3	1	2	0	0			
Total	33*				9				1			

*Some women used more than one coping strategy

Table 5

Number of Women for Whom the Pain Interfered with Various Activities, and Who are Interested in a Non-Pharmacological and Non-Surgical Treatment, Among Those with Pain Over 60 mm

effect of pain	pain before and during group	pain during menses group	pain before menses group
miss a day a month from school/work	17 (52%)	4 (44%)	0 (0%)
interferes with social life	28 (85%)	7 (78%)	1 (100%)
reduced productivity	27 (82%)	7 (78%)	1 (100%)
sleep less	10 (30%)	4 (44%)	0 (0%)
sleep more	13 (39%)	1 (11%)	1 (100%)
interest in non-drug, non-surgery treat	21 (64%)	8 (89%)	1 (100%)
Total	33*	9	1

*Some women experienced interference in more than one area.

Discussion

In this study, 184 of 210 women suffer from some pain during their menses, and 43 women (23%) suffer from pain over 60mm (on a 100 mm visual analogue scale). Of the total 184, 120 (65%) are interested in a non-pharmacological and non-surgical treatment. Examining only those women with self-rated moderate to severe pain, 30 (70%) are so inclined. This finding indicates that there is a population in need of non-drug treatment of dysmenorrhea. However, the majority of the women are interested in a short (six hours or less) treatment. Therefore, to increase the number of participants and reduce dropouts, a treatment for this disorder needs to be relatively short.

These women have tried various coping strategies (taking prescription and non-prescription medication, going to bed, exercising and distraction) which they feel help them cope with the pain. However, these strategies do not reduce the pain sufficiently for them to be able to carry on with their activities in a regular fashion, as is indicated by the large number of women whose productivity, sleep patterns, social life and school/work performance is affected. Therefore, a psychological treatment which is different from these self-prescribed treatments needs to be developed. The four interference measures were heavily endorsed by the women; therefore, all four should be included as outcome measures. Finally, pain reports varied by time of cycle. Therefore, pain should be measured when experienced and not at a later time.

STUDY 2

An extensive literature search was conducted to find a scale that measures cognitive versus somatic treatment expectations. No such scale was found. Therefore, Study 2 was conducted to develop the required measure. This measure dealt with content rather than outcome expectations.

Method

Subjects

The subjects were 48 female students in two undergraduate psychology courses at the University of Western Ontario. Participation in the study was voluntary.

Measures

After in-depth interviews with four dysmenorrheic women, a treatment content expectations questionnaire was constructed (Appendix B). This questionnaire requested the women to rate 24 different outcomes for treatment on a 7-point scale from "not important at all" to "extremely important". Twelve outcomes were somatically oriented (e.g., "help me make my pelvic area feel numb") and twelve were cognitively oriented (e.g., "help me take my mind off the pain"). Consequently, the score for each subject on each scale could range from 12 to 84. The subjects were also asked to rate the pain of their average menstrual period on a 100mm visual analogue scale. On one end of this scale was written "no pain at all" and on the other end "the most intense pain imaginable".

Procedure

In two separate courses, after the lecture was over, the lecturers asked the women to stay and fill out a questionnaire, emphasizing that it was voluntary and anonymous. All the women agreed to fill out the questionnaire. In the first study, the characteristics of women with severe dysmenorrhea were explored. Therefore, the cut-off was 60 mm on a 100 mm visual analogue scale. In the present study, expectations of content (as opposed to outcome) of the treatment were examined. In contrast to outcome expectations which may differ according to severity of the pain, there was no reason to assume that content expectations differ according to severity of menstrual pain. Therefore, a more liberal cut-off of 40 mm was used. This left 18 subjects for analysis.

Results

Cronbach α (average of all split-half reliabilities) was calculated for the somatic and the cognitive scales as well as the if each item was to be deleted. Item-total correlations between each item and the cognitive scale and the somatic scale were also determined. For each item, the difference between the correlation with the cognitive scale and the somatic scale was calculated. During each step, one somatic and one cognitive item were deleted from the analysis. The items chosen to be deleted had the smallest difference between the two correlations, thus, they were not uniquely cognitive or somatic. Care was taken, by ensuring that the alpha after removal was as high as that before removal, that the reliability of each scale when the item was removed would remain high. This was continued until ten items (five cognitive and five somatic) were deleted and seven

cognitive and seven somatic items remained (Appendix C). For each item retained, the difference between correlations with the two scales was over 0.23. Table 6 presents item-total correlations of retained items, as well as the efficiency index for each item. The efficiency index of the items in this study ranged from 0.26 to 0.70. Cronbach α of the scales was 0.86 for the cognitive scale and 0.85 for the somatic scale (see Table 7). These scales are not significantly correlated (r=0.36, p<0.08).

Table 6

Item-Total Correlations and Efficiency Index for the Items of the Treatment Expectations Scale

	Item mean	Item SD	Correlation with the cognitive scale	Correlation with the somatic scale	Efficiency index
Somatic items:					
Q1	3.89	0.48	0.16	0.71	0.47
Q6	4.44	0.29	0.34	0.82	0.56
Q8	5.44	0.36	0.56	0.83	0.38
Q11	4.28	0.43	0.18	0.73	0.50
Q12	5.83	0.39	-0.13	0.53	0.26
Q14	5.50	0.28	0.54	0.85	0.43
Q16	4.44	0.41	0.41	0.72	0.35
Cognitive items:					
Q2	5.28	0.41	0.82	0.19	0.63
Q4	4.89	0.46	0.88	0.27	0.70
Q7	4.50	0.42	0.70	0.32	0.39
Q9	5.28	0.34	0.74	0.16	0.52
Q20	3.94	0.47	0.66	0.40	0.28
Q21	5.39	0.33	0.71	0.10	0.49
Q22	4.94	0.37	0.71	0.48	0.27

Table 7

Cronbach ∝ Reliability of the Cognitive and Somatic Subscales

	Reliability	Mean Score	Standard Deviation of Scores
Cognitive Scale	0.863	34.22	8.84
Somatic Scale	0.845	33.83	8.26

Discussion

After in-depth interviews with dysmenorrheic women, 24 items tapping possible outcomes of a treatment were developed. Twelve of the items were somatically oriented and twelve were cognitively oriented. These scales were refined by dropping out items that did not differentiate well between cognitive and somatic expectations. Fourteen items, seven with a cognitive and seven with a somatic outcome were retained. Together these items create two distinct scales - a cognitive and a somatic scale. Each scale has a high split-half reliability. This questionnaire is expected to be useful in measuring expectations for treatment content and perception of content among dysmenorrheic women.

STUDY 3

In Study 3, the main hypotheses were examined. This study drew on the findings in Study 1 for a definition of the dysmenorrheic population, namely women with pain during menses (some also have pain before menses). Results from Study 1 contributed to the development of the dependent measures as well as to the development of the treatment. Specifically, the four areas (social, sleep, productivity and time) which were rated by the women, in Study 1, as being disrupted by pain were included in the measures for Study 3. In addition, given the data obtained in Study 1, pain was measured at the time it was experienced. Following the finding that most women preferred a treatment of six hours duration or less, the treatment duration was limited to slightly over six hours. Finally, care was taken to present the approach as distinct from the self-help techniques that the women rated as only marginally helpful (e.g., exercise). In Study 2, the treatment expectation questionnaire was developed. This scale was used in Study 3 to determine if patients were matched or mismatched to treatment.

Method

Subjects

Seventy-one women suffering from pain during (and for some women also before) menstruation were involved in this study. They were recruited through advertisements in two university newspapers, the "Western News" and the "Gazette", feature articles in the university newspaper, the "Western News" and in the city's newspaper, "The London Free Press", and through posters on University bulletin boards. The

age range was 17-48 years with a mean of 27. Twenty-one women (30%) dropped out during the baseline period, and four (6%) dropped out during treatment. Therefore, 46 women remained in this study.

Measures

Several types of measures were used: pain, menstrual distress, menstrual interference, treatment expectations, treatment perception, locus of control, diagnostic history, and medication use. These measures were combined into a pre-treatment questionnaire (Appendix D), a baseline questionnaire (Appendix E), a treatment-expectations questionnaire (Appendix F), a treatment-content questionnaire (Appendix G), a post-treatment questionnaire (Appendix H) and a follow-up questionnaire (Appendix I). As indicated in the introduction, dysmenorrhea affects both pain and non-pain aspects of womens' functioning. Therefore, pain, menstrual distress and menstrual interference were the dependent variables used in this study. In choosing the scales for the measures in this study, preference was given to standardized scales that had been used in previous research.

Pain measures. All women were presented with a 100mm visual analogue scale, ranging from "no pain at all" to "the most intense pain imaginable". A vertical version of this scale was found to produce a uniform distribution and correlate with other pain measures (Scott & Huskisson, 1976). For the pre-treatment questionnaire, the women rated their most painful period ever, least painful period ever, and amount of pain during their usual period. For the other questionnaires (baseline, post-treatment and follow-up), the participants rated the most pain during the menstrual period they were

experiencing, the least pain during their menstrual period and the average pain during their menstrual period. The McGill Pain Questionnaire (MPQ, Melzack, 1975) was used as well. For the pre-treatment questionnaire women rated the amount of pain in their usual period. For all other questionnaires (baseline, post-treatment and follow-up), participants rated the average pain during the period they were experiencing. The MPQ provides scores obtained from rank order of selected adjectives on the affective (scores range from 0 to 14), sensory (scores range from 0 to 42) and evaluative (scores range from 0 to 5) dimensions of the pain experience. This scale was found to have moderate to high reliability (0.35 to 0.90) and good concurrent and predictive validity (Reading, 1983).

Menstrual distress measures. The Moos Menstrual Distress Questionnaire (MDQ) was used (Moos, 1985). This scale was constructed to measure the distress of the pre-menstrual period as well as the distress of dysmenorrhea. The MDQ consists of 47 symptoms rated on six-point scales. The symptoms are then grouped into eight factors. The eight factors are: pain, concentration, behavioral change, autonomic reactions, water retention, negative affect, arousal, and control. Three scales (pain [scores range from 0 to 24], behavioral change [scores range from 0 to 20] and negative affect [scores range from 0 to 32]) contain items relevant to the pain and discomfort during the menses. The remaining five scales contain items that pertain to the discomfort prior to this phase. The women in this study were not expected to show improvement on these five additional scales. The scales were included for completeness only. Internal

consistency scores, for the eight scales, range from 0.59 to 0.89. When comparing questionnaire responses to interview responses, this questionnaire was fairly accurate in diagnosing the pre-menstrual syndrome (Moos, 1985). No information is provided on the MDQ's validity for dysmenorrhea, although it is widely used (Moos, 1985).

Menstrual interference measures. The degree to which menstrual pain and discomfort interfered with the woman's social life, work/school activities, sleep and productivity from one day before the menses untill one day after was measured using 4- or 7-point scales. The degree to which it interfered with social life and productivity was measured on 4-point scales (not at all, mildly reduces it, moderately reduces it, greatly reduces it). The degree it affected work/school activity was measured on a 7-point scale from missed 1 hour that period to 3 or more days. The degree it affected sleep was measured on a seven point scale from sleep over 4 hours more than usual through "no difference" to sleep over 4 hours less than usual.

Treatment expectations. A scale measuring the degree the patient expects the treatment to target somatic versus cognitive components was developed in Study 2 and used in Study 3 (see Appendix F). This is a measure of treatment-content expectations rather than treatment-outcome expectations, and was measured both before the baseline period and at the end of treatment.

Treatment content. Women were asked to rate the degree to which the treatment they had participated in covered various aspects. The items were identical to those used for the treatment-expectations measure (see Appendix G).

Treatment perception. This is a measure of the women's compliance and evaluation of the treatment that they received. This measure consisted of four closed questions: (a) "Did you practice the techniques at home between sessions?" "Not at all", "rarely", "sometimes", "almost always", "always"; (b) "Do you feel that this treatment helped reduce your pain?" "Not at all", "somewhat", "very much", "a great deal"; (c) "Do you feel this treatment helped you deal with your pain better?" "Not at all", "somewhat", "very much", "a great deal"; (d) "Was what you did in treatment similar to what you expected to do?" "Not at all similar", "somewhat similar", "very similar", "identical".

Locus of Control. Locus of control was measured using the Multidimensional Health Locus of Control scale published by Wallston, Wallston and DeVellis (1978). This scale provides scores on internal, powerful other and chance locus of control dimensions. Alpha reliability for these scales ranges from 0.67 to 0.77. The questionnaire was found to have good construct validity with a general locus of control scale (developed by Levenson, and cited in Wallston et al., 1978) and good predictive validity (predicting health status). The authors also found the three scales to be independent (Wallston et al., 1978).

Diagnostic history. This scale assessed the womens' previous diagnostic history. The following questions were included: (a) age; (b) age started menstruation; (c) age started having menstrual pain (the difference between present age and age started having pain was then determined); (d) if the women had seen a physician because of menstrual pain and, if so, what diagnosis they received; (e) what did the physician prescribe, did they follow the prescription and did it

help. All questions asking if pain was reduced were of this nature: "After doing it my pain was:" "The same as before", "somewhat less", "much less than before", "gone". This scale is of unknown reliability.

Medication Use. Women were asked to list the amount and type of medication used for pain control or for birth control during each menstrual period in the baseline, post-treatment and follow-up periods. Medication use is a common measure used in pain control studies; therefore, no validity data were collected on this self-report measure.

Procedure

The movement of subjects through the research is detailed in Figure 1. As stated in the subject section, the participants were recruited through advertisements and two feature stories. When the women contacted the experimenter by telephone, the study was briefly described and they were asked to come in to fill out a questionnaire.

When the women came in, they were informed that three treatment groups were being compared and that they would be assigned randomly to a treatment. They were further informed that they could leave the study at any time without any adverse effects. Any questions they had were answered, except those that pertained to treatment content. The women signed a general consent form during this session, and a consent form specific to their treatment group during the first treatment session (see Appendix J). The women were randomly allocated to a wait-list control group or to one of two treatment groups. Although it was not possible to ensure equal numbers of matched and

Figure 1

Movement of Subjects Through the Study

Month	1	2	3	4	5	6	7	8	9	10
Group										
Cog. or Som.	Pre-Therapy Ques.	Base-line Ques. 1	Base-line Ques. 2	Therapy ------- Post Therapy Ques. 1	Post-Therapy Ques. 2		Follow-Up Ques. 1		Follow-Up Ques. 2	
Wait-List/ Combined Therapy	Pre-Therapy Ques.	Base-Line Ques. 1	Base-Line Ques. 2	Base-Line Ques. 3	Base-Line Ques. 4	Therapy ------- Post Therapy Ques. 1	Post-Therapy Ques. 2		Follow-Up Ques. 1	Follow-Up Ques. 2

mismatched women in the groups (due to scheduling difficulties), by chance, the number of matched and mismatched women in each group was equal. The women were given the pre-treatment questionnaire (see Appendix D) to complete. This questionnaire included menstrual distress, menstrual interference, treatment expectation, locus of control, pain, diagnostic history, and medication use measures. Women who were assigned to a treatment group were given two baseline questionnaires to fill out during two baseline menstrual periods. Women in the wait-list control condition were given four baseline questionnaires. All baseline questionnaires included pain measures, interference measures, distress and medication use measures.

There were three groups, two different treatment groups of 15 women each (one was a somatic group and the other a cognitive group) and a wait-list control group of 12 women. After the waiting period, the wait-list control group received a combined treatment. A fourth group, an attention-control manipulation, was abandoned after one small treatment group of four women worsened following the treatment. Women were informed that three treatments were being compared in this study. All groups were treated by the researcher who had experience in treating pain patients and in conducting groups. The therapist was blind to expectation ratings and other variables measured on the questionnaires.

The women were treated in small groups of two to four. They began treatment approximately two months after they completed the pre-treatment questionnaire. Small treatment groups were scheduled according to the time of the participants' periods to enable them to attend four weeks of treatment before having another period, and their

schedules. They women were telephoned and given the date and time of their meetings. The treatment was conducted in four weekly sessions of 2 hours each.

Although the two treatment groups, and combined treatment group (given to the control group) followed similar treatment patterns, the content of the sessions was unique to the specific treatment approach. The general pattern was a modification of Meichenbaum's stress inoculation training, providing an education phase, skills acquisition phase and skills application phase (Turk, Meichenbaum & Genest, 1983), used by Quillen & Denney (1982). The cognitive elements (e.g., distraction) in Quilllen and Denney's treatment were used for the cognitive group, the physiological elements (e.g., relaxation) for the somatic group and the full package for the wait-list group when it became a combined treatment group. The specific components in the treatment approaches are described in the following section.

The women in the <u>somatic</u> group were given a rationale emphasizing the importance of muscle contraction in the maintenance of the pain and the advantages of learning body-based techniques to alleviate the pain as follows:

> Although some people may have said or implied that your pain is "imaginary" or "in your head", that is not true. You probably know that your pain is real. Pain is always real. The question is not if the pain is real or not, rather what are the factors contributing to it, and how can it be reduced. As early as 1934, it was found that women like you may be experiencing extreme pain during menstruation as a result of high pressures in the uterus. It was found that in women like yourselves, the muscles around the uterus contract much stronger and more often than in women who do not suffer a lot of pain in menstruation. Even between contractions the muscles are found to be tighter than in other women. This pattern of contractions leads to

> tightening up the blood vessels in the muscles and the uterus. The blood vessels are constricted, and less blood can flow through them. This is painful and is probably the major cause of the pain you experience before or during menstruation. The pattern of muscle contractions just described may be a result of the body producing too much of a substance called prostaglandins. The prostaglandins contract the muscles. Or perhaps, you feel pain and as a consequence hold your muscles tightly (which is something we do when we are in pain) and this leads to even more pain. It may also be that this pattern is something you were born with. Relaxing the muscles will reduce the tightening of the blood vessels and thus reduce the pain. Although we all know how to relax and take it easy, most of us do not know how to relax our bodies, and probably none of us know how to relax a specific area in our body. That is what we will learn in these sessions. In addition you will learn to numb all sensation in your menstrual discomfort area and practice doing this while imagining you are in pain.

The first two sessions were spent practicing various types of relaxation (deep muscle, imagery assisted, etc.). This was especially important since Borgeat, Stravynski and Chaloult (1983) found different subjective reactions to progressive relaxation (sleepiness) and autogenic training (deeper mental relaxation) and suggest either tailoring the relaxation to the client, or teaching several techniques so the patient can choose one according to his/her needs at the time. All participants were given relaxation tapes and asked to practice twice daily at home. During the third session, participants were taught to numb their menstrual discomfort area through feelings of warmth and numbness induced by imagining a warm liquid flowing down from their stomach. They were asked to press down on their discomfort area and "make the sensation go away" using their relaxation and numbing techniques. After they had mastered that, they were asked to press down on their menstrual discomfort area while imagining scenes involving menstrual pain and make the pressure felt from their hand

"go away". In the fourth session, the women practiced self-relaxation. They were taught the importance of using body sensations to detect when the pain is about to start before it is strong, so they can employ their techniques early in the pain sequence. They also practiced their techniques as in Session 3.

The women in the cognitive group were first asked to share their thoughts and feelings at various points during their menses: before menstruation, during menstruation before the menses is painful, during pain, during their worst painful period and during their least painful period. These were discussed in the small treatment groups and the self-defeating nature of their cognitions was pointed out. Then they were taught the connection between their thoughts and pain and the importance of changing their cognitions to modify their pain, as follows:

> Although some people may have said or implied that your pain is "imaginary" or "in your head", that is not true. You probably know that your pain is real. Pain is always real. The question is not if the pain is real or not, rather what are the factors contributing to it, and how can it be reduced. As early as 1959 it was proposed that the degree of pain you feel depends on the context in which you experience it. In some cases very large injuries will result in little or no pain as was found with soldiers who were released to go home as a result of their injury. In other cases relatively mild problems will result in a lot of experienced pain. For example, if you have a backache and think it means you have cancer. A large body of literature now points out that there is a strong connection between what you feel and think and how strong your pain is. Melzack and Wall have proposed the Gate Control Theory which explains that all pain information that comes from the body goes through the spinal cord, and in the spinal cord there is a gate that decides if that information gets to the brain or not. If the gate is open the information goes on to the brain. If the gate is closed, the information does not go, and you will not feel pain, or will feel only a small degree of pain.

> There are several things that can close the gate. One of the major ones is the thoughts and feelings you have. Feelings such as fear, anxiety, and anger serve to keep the gate open, whereas feelings such as control over the situation, the importance of the situation, can close the gate. Therefore, when it is not possible, or not desirable to change the way your body works we can still have a large effect on the pain by helping you feel in control of it, understand what is happening to you and learn how to reduce your anxiety and negative reactions. This should then reduce your pain experience by closing the gate and letting less pain messages enter the brain. Therefore, in these sessions several things will be taught, but the most important is the modification of the way you think about, and talk to yourself and others about your pain.

At the end of the first session they were taught to reinterpret the pain by using different adjectives to describe it.

The second session was used to teach the women distraction using imagery, using mental processes (e.g., working out a math problem) or using external events or objects (e.g., counting ceiling tiles). They were taught how to challenge and change their self-defeating thoughts and given a handout which presented several coping thoughts they may want to use. The importance of using self-reinforcement when trying to reduce the pain was stressed. The women then took turns explaining these methods to each other.

In the third and fourth sessions, the women practiced using their techniques, while imagining scenes involving menstrual pain. These scenes were described in more vivid detail than those used for the somatic group. Additionally, the techniques used to "make the discomfort go away" were reinterpretation, distraction and coping statements rather than relaxation and numbing. The importance of utilizing their techniques early in the sequence was stressed as it was in the somatic group.

After the wait-list period, the control group became a <u>combined</u> treatment group and received a combination of both treatments just described. The rationale emphasized relaxation and cognitions as follows:

> Although some people may have said or implied that your pain is "imaginary" or "in your head", that is not true. You probably know that your pain is real. Pain is always real. The question is not if the pain is real or not, rather what are the factors contributing to it, and how can it be reduced. There are two major components to pain: muscle contractions and how you feel and think about it. As early as 1959 it was proposed that the degree of pain you feel depends on the context in which you experience it. In some cases very large injuries resulted in little or no pain as in the case of soldiers who were released to go home as a result of extensive injuries and did not complain of much pain. In other cases relatively mild problems will result in a lot of experienced pain. For example, if you have a backache and think it means you have cancer you will probably feel a lot of pain. A large body of research now points out that there is a strong connection between what you feel and think and how strong your pain is. Two researchers at McGill University, Melzack and Wall, have proposed the Gate Control Theory which explains that all pain information that comes from the body goes through the spinal cord, and in the spinal cord there is a gate that decides if that information gets to the brain or not. If the gate is open the information goes on to the brain. If the gate is closed, the information does not go, and you will not feel pain, and if it is partially open you will feel only a small degree of pain. There are several things that can close the gate. One of the major ones is the thoughts and feelings you have. Feelings such as fear, anxiety, depression and anger serve to keep the gate open. Focusing on the pain and boredom will open it as well. On the other hand feelings such as control over the situation, happiness, the importance of the situation, and emotional involvement in activities can close the gate. In addition, in 1934, it was found that women like you may be experiencing extreme pain during menstruation as a result of high pressures in the uterus. It was found that in women like yourselves, the muscles around the uterus contract much stronger and more often than in women who do not suffer a lot of pain in menstruation. Even between contractions the muscles are found to be tighter than in other women. This pattern of

contractions leads to tightening up the blood vessels in the muscles and the uterus. The blood vessels are constricted, and less blood can flow through them. This is painful and is probably one of the major causes of the pain you experience before or during menstruation. The pattern of muscle contractions just described may be a result of the body producing too much of a substance called prostaglandins. The prostaglandins contract the muscles. Or perhaps, you feel pain and as a consequence hold your muscles tightly (which is something we do when we are in pain) and this leads to even more pain. It may also be that this pattern is something you were born with. Relaxing the muscles will reduce the tightening of the blood vessels and thus reduce the pain. Therefore, you can have a large effect on the pain by feeling in control of it, understanding what is happening to you and learning how to reduce your anxiety and negative reactions. This should then reduce your pain experience by closing the gate and letting less pain messages enter the brain. Also, although we all know how to relax and take it easy, most of us do not know how to relax our bodies, and probably none of us know how to relax a specific area in our body. That is what we will learn in these sessions. In addition you will learn to numb all sensation in your menstrual discomfort area, and practice doing this while imagining you are in pain. Therefore, in these sessions the most important thing is the modification of the way you think about, and talk to yourself and others about your pain, and learning to relax and numb your body. We are <u>not</u> suggesting that your pain is "in your mind", rather that you can use your natural resources to reduce the degree of pain you feel.

Sessions 1-4 combined elements of the somatic and cognitive treatments.

The treatment-expectations questionnaire was given to all groups again during the last treatment session. The women were asked to rate the importance of the items for treatment. This was intended to permit an examination of possible shifts in expectations after treatment. At this time, a treatment-content questionnaire was also given. For this questionnaire, women rated the degree to which they felt the treatment

they participated in covered the aspects outlined in the treatment-expectations questionnaire.

At the end of treatment, each woman was given two post-treatment questionnaires which included the pain measures, menstrual distress, menstrual interference, medication-use measures and treatment evaluation. Participants were requested to complete the post-treatment questionnaire immediately after their next two menstrual periods and to send each one to the researcher after completion. Two months after completing the second post-treatment questionnaire, the women were mailed a follow-up questionnaire, and, two months after that, a second follow-up questionnaire. Follow-up questionnaires were identical to post-treatment questionnaires on all measures except the treatment evaluation measure which was included in post-treatment questionnaires only. Upon completion of the study, all participants were sent a summary of the results (see Appendix K). In this summary, the treatment approaches were described, and the results were presented. Women were invited to call or send in questions, comments or requests to participate in a different treatment group than the one they had initially been in. Informal feedback from participants indicated most women found the treatment beneficial. Therefore, positive findings were emphasized in the results.

Results

This section is divided into eight sub-sections. The first three sub-sections examine manipulation checks, compare dropouts to treatment patients, and examine changes in the control group. The fourth, fifth and seventh sub-sections reflect results on the three hypotheses. The sixth sub-section investigates changes on a new

dependent variable - medication use - which appeared to be important during the study. Finally, the last sub-section reports on exploratory analysis of the factor structure of the dependent measures.

Did the Treatment Given to the Groups Accurately Reflect the Intention?

All treatment sessions were taped. One 10 minute segment was randomly chosen from each of the 44 cognitive or somatic session tapes. Two trained psychology research assistants listened to the segments and rated each one as cognitive, somatic or unsure. Rater agreement was calculated as percent agreement over total number of tapes. No tape was misclassified. Four tapes were rated as unsure by one rater. Percent agreement was 91%. The Kappa statistic corrects for the percent agreement by chance alone (Hubert, 1977). This measure was calculated and was found to be 0.83, and significant at 0.000001.

After treatment, the participants completed a treatment-content questionnaire (Appendix G). This questionnaire instructed participants to rate the degree the treatment covered the various aspects. This questionnaire yielded a cognitive coverage score and a somatic coverage score. For each subject, the score could range from 7 to 49 on each of the cognitive and somatic scales. The difference between these two scores was a rating of the treatment orientation. Scores between +1 and +49 indicated a cognitive orientation, while scores between -49 and -1 indicated a somatic orientation. A score of 0 showed a neutral orientation.

In the cognitive group, 14 out of the 15 subjects rated the treatment as being cognitively oriented. One woman rated it as being mildly somatically oriented (score of -1). In the somatic group 10 women rated it as somatically oriented, one as neutral (score of 0), and four as slightly cognitive (score of +1). A t-test comparing the mean orientation in the cognitive group (11.2) with that in the somatic group (-6.6) was significant [$t(28)=6.99$; p 0.0005]. Therefore, the women in this study perceived the orientation accurately.

Did the Subjects Who Dropped Out Differ Significantly From Those that Remained in the Study?

From 71 women who volunteered to participate in this study, 21 women dropped out during the baseline period (13 from the two treatment groups and 8 from the wait-list group). Four women returned to their physician and received a different treatment that reduced their pain, four experienced changes in employment (hired, fired, change in work load), three moved out of London, two women had been experiencing dysmenorrhea for a short period of time, and the remaining eight women declined to give a reason for dropping out. Four women dropped out during treatment (three from the cognitive group, one from the somatic group). One woman moved out of London and the other three were unable to find the time to practice at home between sessions.

Dropouts and treatment subjects were compared on expectations for treatment, Multidimensional Health Locus of Control (internal, powerful other and chance), age and age started menstruation (Table 8). The multivariate analysis of variance (MANOVA) was not

Table 8

Means and Standard Deviations for Dropouts and Treatment Subjects

	Dropouts		Treatment Subjects	
Variable	Mean	SD	Mean	SD
expectation	0.88	9.84	-3.39	9.29
Internal Locus of Control	25.72	3.71	26.43	3.74
Powerful Other Locus of Control	16.32	6.16	14.09	4.87
Chance Locus of Control	15.80	5.15	14.00	5.29
age	25.04	7.18	27.02	7.93
age started menses	12.32	1.65	12.33	1.37

significant (F=1.098; p=0.373). None of the univariate analyses of variance (ANOVAs) was significant either. Therefore, dropouts and treatment subjects did not differ on the dimensions measured.

Did the Wait-List Control Group Change During the Waiting Period?

The control group changed dramatically during the wait-list period on most measures (see Table 9). To minimize type 1 error, the α was divided into 13 (0.05/13=0.0038). This yielded three outcome variables (most pain, sensory pain and Moos pain) which were significantly reduced during the baseline period.

Treatment Effects

This study was a control-group design. Therefore, analyses were performed to compare between the three groups using MANOVAs. When significant interactions between time (pre, post) and group (cognitive, somatic, wait-list) were found, ANOVAs and posteriori comparisons were performed to determine which groups differed on which variables. Although pre-post differences within groups were potentially interesting, these analyses were not performed as they would increase the type 1 error without providing a significant amount of new information.

For the analyses in this section, post-treatment measures for the cognitive and somatic treatment groups were compared to the second set of baseline questionnaires given to the wait-list control group (periods 3 and 4 in the baseline period, see Figure 1).

The treatment and wait-list subjects were compared on background variables (age, age of menarche, age when started experiencing dysmenorrhea, expectations and locus of control) using a MANOVA. As

Table 9

t-Tests Comparing Mean of Period 1&2 to Mean of Period 3&4 for Wait-List Group

	Period 1&2 Mean	SD	Period 3&4 Mean	SD	t	Probability
usual	47.00	14.21	28.77	19.55	3.07	0.006
least	8.91	11.00	10.77	14.63	0.54	0.302
most	71.86	13.06	46.23	27.73	3.67	0.002
sensory	17.95	4.96	11.50	5.25	3.75	0.002
affective	2.77	1.54	1.32	1.29	2.80	0.008
evaluative	2.73	0.91	2.00	1.30	1.72	0.058
Moos-pain	10.55	3.75	8.14	4.86	3.49	0.005
Moos-affective	14.05	7.76	10.73	9.38	2.19	0.027
Moos-behavior	5.09	3.11	3.55	3.23	2.71	0.011
time-missed	0.27	0.65	0.00	0.00	1.40	0.192
productivity	1.50	0.74	1.00	0.87	3.32	0.004
social	0.86	0.78	0.68	0.64	0.80	0.220
sleep	1.44	0.94	0.75	2.58	2.58	0.018

expected, there were no significant differences between subjects in these groups ($F(7,32)=0.95$, $p<0.48$). The groups were not significantly different (using the Kruskal-Wallis non-parametric test) on use of oral contraceptives ($\chi^2=1.5$, $p<0.47$), presence of secondary dysmenorrhea ($\chi^2=1.5$, $p<0.47$) or parity ($\chi^2=1.5$, $p<0.47$). None of the women had an intrauterine device. The treatment and wait-list subjects were also compared using MANOVAs on pre-treatment scores on the dependent variables. Neither MANOVA, using pain or non-pain variables, was significant ($F(14,12)=2.606$, $p<0.052$, for pain variables; $F(12,14)=1.860$, $p<0.134$, for non-pain variables). Only one ANOVA (for time-missed) was significant ($F(2,12)=4.505$, $p<0.035$); this effect will be discussed below.

Table 10 presents descriptive statistics. On approximately one third of the measures (4 measures) at least 50% of the women in each treatment group displayed reductions in their pain or discomfort scores after treatment. On an additional five measures, at least 50% of the women in one treatment group showed improvement. More women improved on usual pain, most pain and the Moos menstrual distress questionnaire behavior scale in any group, than on the other measures.

Table 11 presents the results of a repeated measures MANOVA on the seven pain measures between the cognitive, somatic and wait-list control groups. As can be seen in the table, there is a significant treatment by time interaction. In addition, the time main effect is significant. Individual ANOVAs performed on the time main effect revealed that all pain variables were reduced from pre- to post-treatment (see Appendix L).

Table 10

Means at Pre- and Post-Treatment, and Percent Showing Change

	Cognitive group			Somatic group			Wait-List group+		
	pre	post	%	pre	post	%	pre	post	%
usual	43.37	27.27	73	50.37	40.77	67	46.83	28.77	75
least	7.97	2.57	60	16.80	12.80	47	8.42	10.77	50
most	66.87	45.13	80	70.93	59.20	60	70.71	46.23	75
sensory	13.13	11.95	53	17.17	15.58	47	17.71	11.35	83
affective	1.77	1.10	33	3.33	2.10	47	2.62	1.32	50
evaluative	2.65	1.21	73	2.38	2.37	13	2.71	1.96	42
Moos pain	9.70	7.00	73	10.73	9.80	53	10.37	8.14	58
Moos affective	7.60	7.37	47	9.90	9.33	53	13.37	10.73	58
Moos behavior	6.76	3.26	73	7.32	5.70	67	5.29	3.31	67
time missed	1.25	0.11	13	1.63	0.77	13	0.25	0.00	17
productivity	1.38	1.06	40	1.77	1.33	40	1.50	0.96	25
social	1.24	0.35	73	1.17	0.82	27	0.92	0.65	25
sleep	-0.80	-0.37	47	-0.63	-0.20	20	0.08	0.04	33

*percent of women, out of total in group, who improved

+for wait-list post refers to second set of baseline measures

Table 11

Repeated Measures Wilks MANOVA on the Seven Pain Variables Comparing the Cognitive, Somatic and Wait-List Control Groups

	value	F	error DF	P
Treatment main effect				
	0.21	1.03	12	0.485
Time main effect				
	0.16	4.32	6	0.047
Treatment by time interaction				
	0.04	3.21	12	0.025

Table 12 presents individual ANOVAs performed for the significant treatment by time interaction found in the MANOVA. There are significant interactions for sensory pain and for evaluative pain. A posteriori comparisons of pre-treatment means for these two variables revealed, as expected, no significant differences. Similar comparisons on post-treatment means are presented in Table 13, and reveal that for sensory pain the somatic group differs from both the cognitive treatment and the wait-list control groups which do not differ from each other. Based on means from Table 10, it is clear that women in the somatic group reduced their sensory pain scores less than women in the cognitive and wait-list control groups (see Figure 2). For evaluative pain the cognitive and somatic groups differ at post- (but not pre-) treatment. Based on means from Table 10, it appears that the cognitive group improved more than the somatic group. In addition, there was a non-significant trend for the cognitive group to improve more than the wait-list control group (see Figure 3).

Table 14 presents the results of a MANOVA performed on the six non-pain variables between the cognitive, somatic and wait-list control groups. There was a significant treatment by time interaction as well as a significant time main effect. Table 15 presents individual ANOVAs on the treatment by time interaction. There are significant interactions for behavior change, time missed, productivity and social interference. These four variables were also significantly reduced from pre- to post-treatment (see Appendix M). A posteriori comparisons were conducted on the four variables for which a significant interaction was found (Table 16). Pre-treatment means on Moos behavior revealed no significant differences, whereas

Table 12

Treatment by Time Interaction Individual ANOVAs on Pain Variables Comparing the Cognitive, Somatic and Wait-List Control Groups+

	Hypothesis MS	error MS	F
usual	141.38	154.34	0.92
least	107.01	35.66	3.00
most	312.08	166.34	1.88
sensory	41.08	10.05	4.09*
affective	0.87	1.54	0.56
evaluative	5.24	0.44	11.86**
Moos pain	6.22	3.02	2.06

\+ df=2,12

* $p < 0.04$

** $p < 0.001$

Table 13

A Posteriori Comparisons of Post Treatment Means, Using Duncan's Multiple Range Test

sensory pain:	
cognitive vs. wait-list	Not Sig.
somatic vs. wait-list	Significant
cognitive vs. somatic	Significant
evaluative pain:	
cognitive vs. wait-list	Not Sig.
somatic vs. wait-list	Not Sig.
cognitive vs. somatic	Significant

Figure 2
Treatment by Time Interaction Comparing the Cognitive, Somatic and Wait-List Control Groups on Sensory Pain

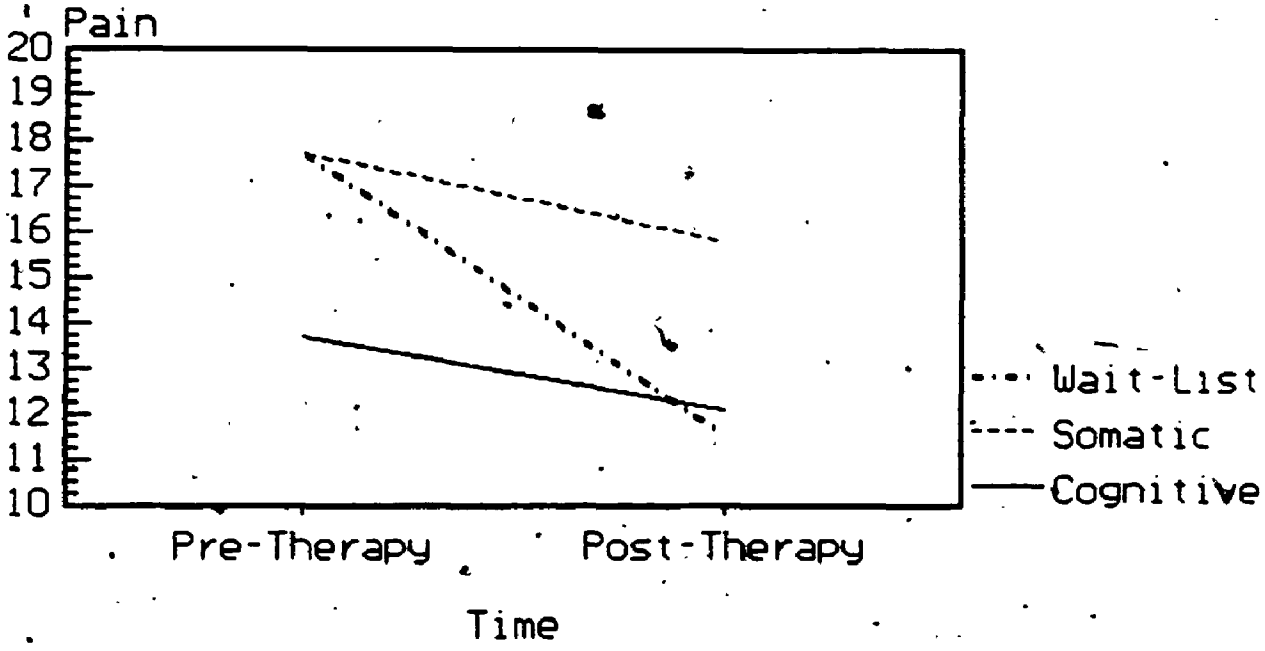


Figure 3
Treatment by Time Interaction Comparing the Cognitive, Somatic and Wait-List Control Groups on Evaluative Pain

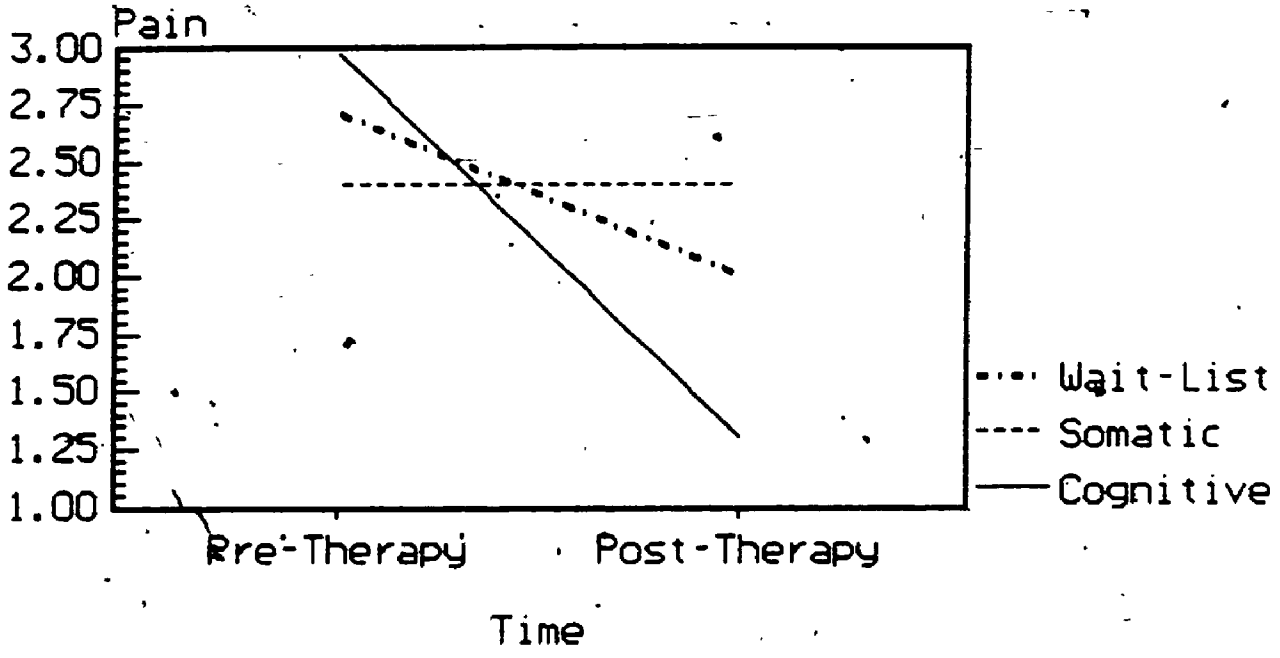


Table 14

Wilks MANOVA on the Six Non-Pain Variables Comparing the Cognitive, Somatic and the Wait-List Control Groups

	value	F	error DF	P
Treatment main effect				
	0.23	1.26	14	0.334
Time main effect				
	0.06	18.67	7	0.001
Treatment by Time interaction				
	0.05	3.89	14	0.009

Table 15

Treatment by Time Interaction. Individual ANOVAs on Non-Pain Variables Comparing the Cognitive, Somatic and Wait-List Control Groups+

	Hypothesis MS	error MS	F
Moos negative affect	21.66	14.26	1.52
Moos behavior change	120.65	4.94	24.40**
time missed	13.02	1.08	12.07*
productivity	4.70	0.34	13.62*
social	7.06	0.21	33.24**
sleep	1.90	0.46	4.14

\+ df=2,12

* $p < 0.005$

** $p < 0.0005$

Table 16

A Posteriori Comparisons of Post-Treatment Means Using Duncan's Multiple Range Test

Moos behavior change:	
cognitive vs. wait-list	Not Sig.
somatic vs. wait-list	Not Sig.
cognitive vs. somatic	Significant
Time missed:	
cognitive vs. wait-list	Not Sig.
somatic vs. wait-list	Significant
cognitive vs. somatic	Significant
Productivity:	
cognitive vs. wait-list	Not Sig.
somatic vs. wait-list	Not Sig.
cognitive vs. somatic	Not Sig.
Social interference:	
cognitive vs. wait-list	Not Sig.
somatic vs. wait-list	Not Sig.
cognitive vs. somatic	Significant

the cognitive and somatic treatment groups differed on post-treatment means. Based on means from Table 10, it is clear that women in the cognitive group reduced their behavior interference score, on the average, more than women in the somatic group (see Figure 4).

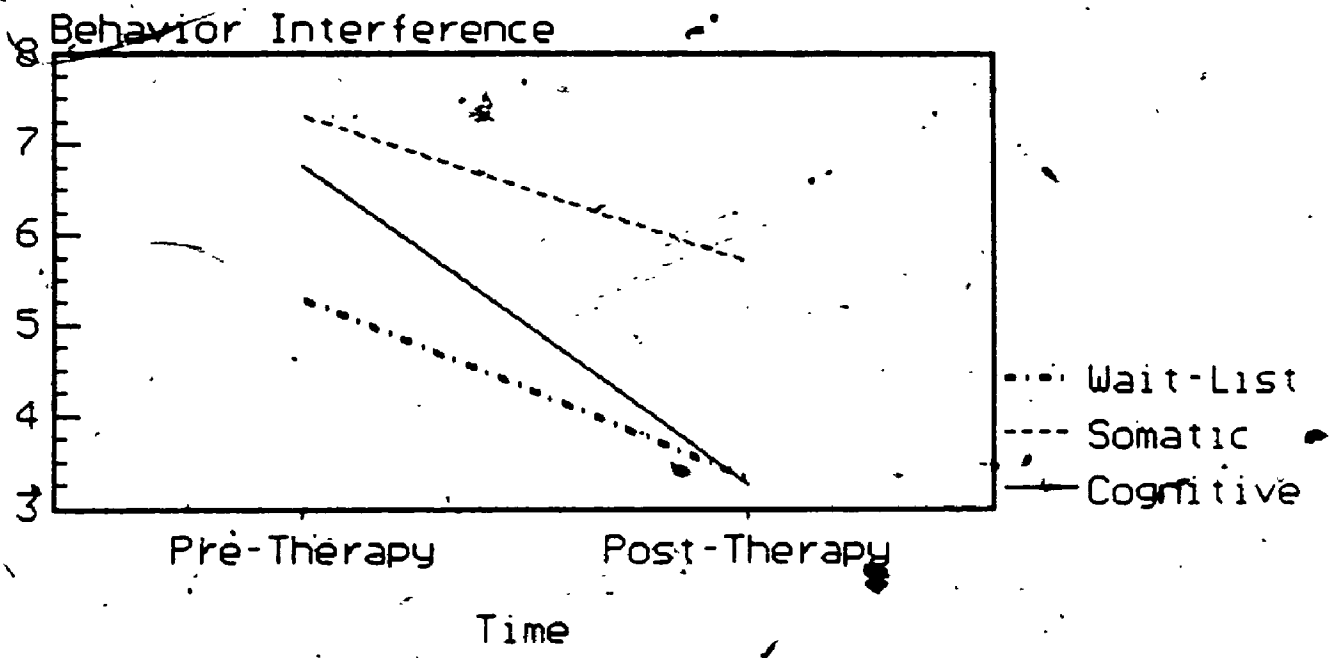
For time missed, there were significant pre-treatment differences between the wait-list control group and the other two groups. The difference between the wait-list control group and the cognitive group disappeared at post-treatment, while the difference between the somatic and the wait-list control group remained at post-treatment (see Figure 5).

Comparing groups on productivity interference scores, there were no significant pre-treatment or post-treatment differences. Additionally, there do not appear to be large differences in the improvement slopes of the three groups (see Figure 6).

No significant pre-treatment differences were found on social interference. After treatment the cognitive and somatic groups differed with the cognitive group displaying a larger reduction. There was also a non-significant trend for the cognitive group to reduce social interference more than the wait-list control group (Figure 7).

For completeness, the MANOVA was performed again including the five Moos discomfort scales that were not expected to change (Table 17). There was no significant treatment by time interaction and no significant treatment or time main effect. Therefore, no individual ANOVAs were performed.

Figure 4
Treatment by Time Interaction Comparing the Cognitive, Somatic and Wait-List Control Groups on Moos Behavior




2
1.0
1.1
1.25
1.4
1.6
2.8
3.2
3.6
4.0
2.5
2.2
2.0
1.8
MicroCD

Figure 5
Treatment by Time Interaction Comparing the Cognitive, Somatic and Wait-List Control Groups on Time Missed

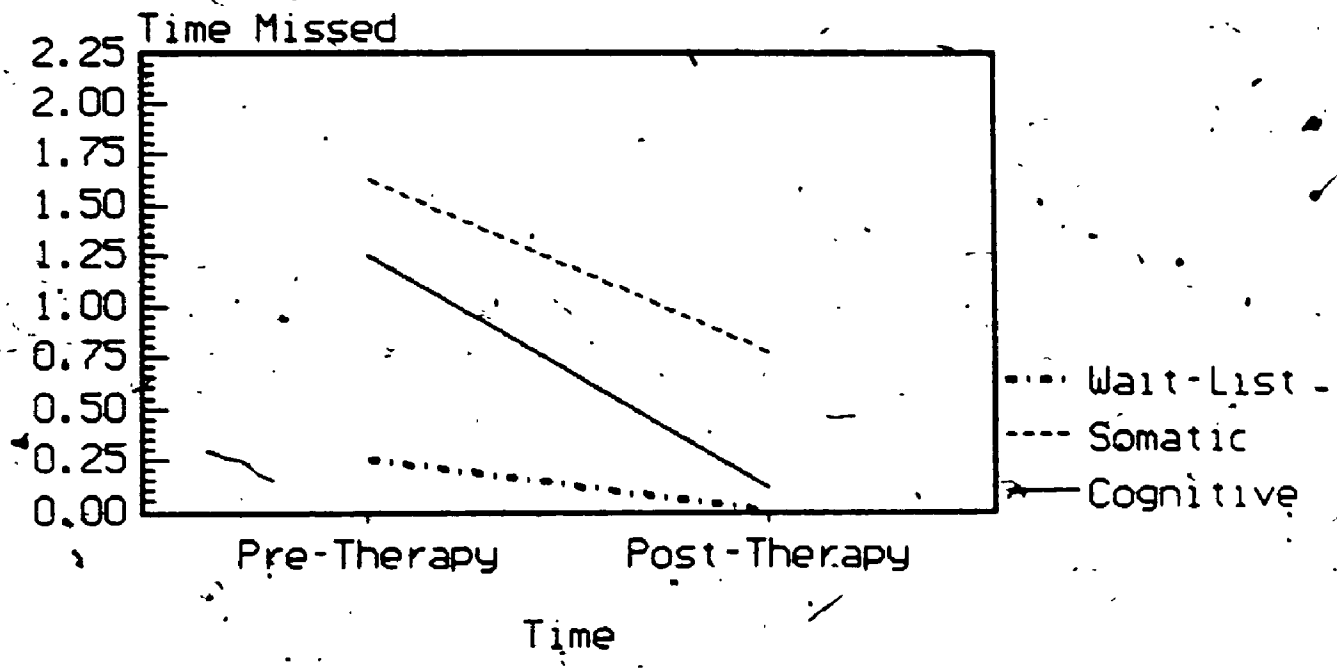


Figure 6
Treatment by Time Interaction Comparing the Cognitive, Somatic and Wait-List Control Groups on Productivity

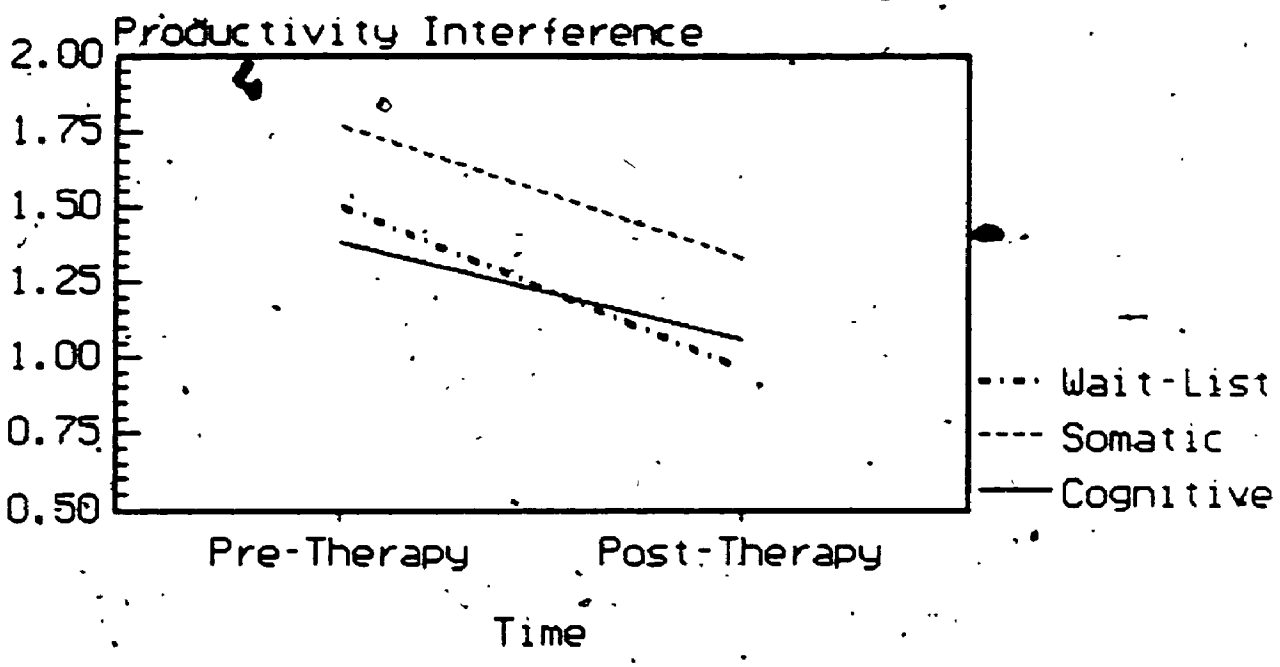


Figure 7.
Treatment by Time Interaction Comparing the Cognitive, Somatic and Wait-List Control Groups on Social Interference

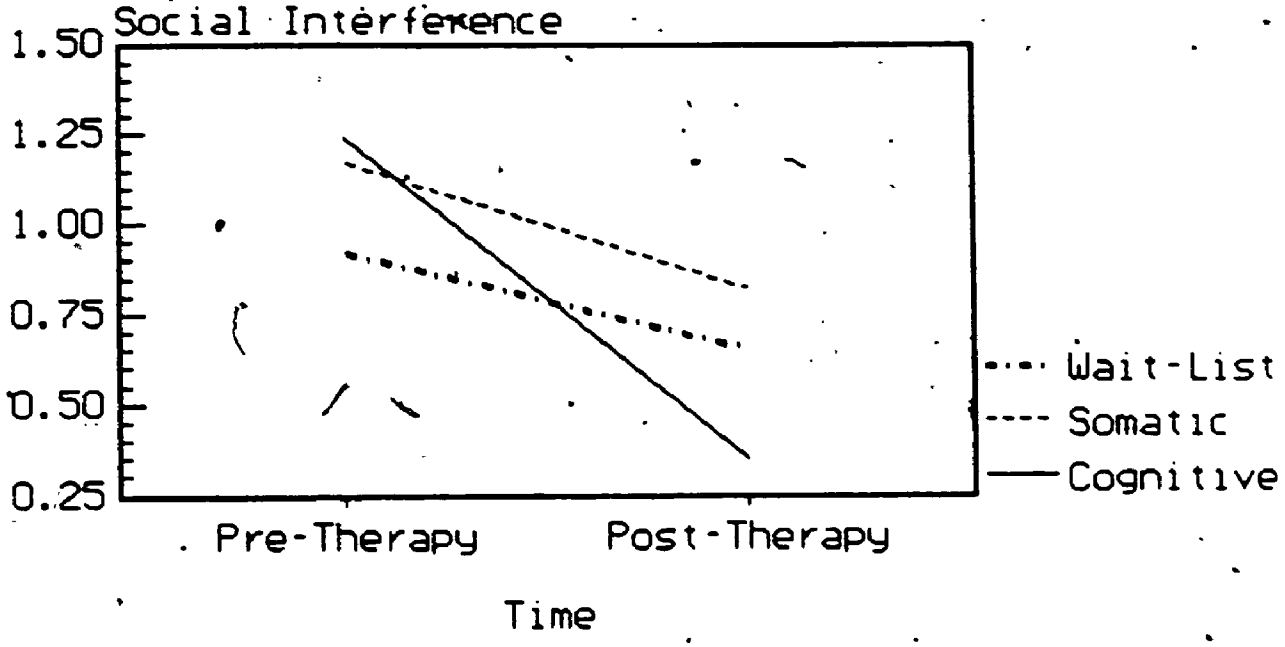


Table 17

Wilks MANOVA on the Eleven Non-Pain Variables Comparing the Cognitive, Somatic and Wait-List Control Groups

	value	F	error DF	P
Treatment main effect				
	0.02	1.10	4	0.524
Time main effect				
	0.01	15.31	2	0.063
Treatment by Time interaction				
	0.01	1.62	4	0.373

Is a Combined Treatment Better Than a Cognitive or a Somatic Treatment?

For these analyses, the measures taken after the combined treatment was given to the wait-list control group were used as post-treatment measures. Therefore, the wait-list control group became a combined treatment group and the three treatment groups (cognitive, somatic and combined) were compared to each other. Baseline and post-treatment data were obtained from all women; follow-up data were obtained from all but six women.

On one third of the measures (four measures), 50% or more of the women in all three groups improved after treatment. On an additional three measures, 50% or more of the women in at least two treatment groups exhibited improvement. Most improvement was seen on usual pain, most pain, sensory pain and Moos behavior (see Tables 10 & 18).

Table 19 presents the results of a repeated measures MANOVA on the seven pain measures between the cognitive, somatic and combined treatment groups. As can be seen in the table, there is a significant treatment by time interaction and a significant time main effect. Individual ANOVAs performed on the time main effect showed that all pain variables were reduced over time (see Appendix N). Individual ANOVAs on the treatment by time interaction are presented in Table 20. There is a significant interaction for evaluative pain (see Figure 8). A-posteriori comparisons on pre-treatment means showed, as expected, no significant difference between the three [illegible]. When comparing post-treatment means (Table 21) a significant difference emerges between the cognitive and somatic treatment groups. Using means from Table 18, it becomes clear that the cognitive subjects benefitted more

Table 18

Group Means at Pre- and Post-Treatment

	Cognitive group			Somatic group			Combined group			
	pre	post	follow	pre	post	follow	pre	post	follow	% improved
usual	43.37	27.27	32.06	50.37	40.77	36.29	46.83	28.50	22.72	83
least	7.97	2.57	4.62	16.80	12.80	9.46	8.42	8.25	5.56	42
most	66.87	45.13	55.92	70.93	59.20	49.36	70.71	45.62	47.17	75
sensory	13.70	12.07	11.46	17.70	15.80	12.96	17.71	11.38	11.67	75
affective	1.77	1.10	1.15	3.33	2.10	1.18	2.62	1.33	1.11	50
evaluative	2.65	1.21	2.06	2.38	2.37	1.57	2.71	1.83	1.69	58
Moos-pain	9.70	7.00	5.81	10.73	9.80	9.11	10.37	8.25	8.83	67
Moos affective	7.60	7.37	7.00	9.90	9.33	7.93	13.37	10.83	13.83	67
Moos behavior	6.97	3.30	3.38	7.43	5.77	4.46	5.29	3.42	3.78	75
time missed	1.23	0.10	0.77	1.63	0.77	0.36	0.25	0.00	0.28	0
productivity	1.45	1.00	1.23	1.80	1.33	1.11	1.50	0.79	0.78	50
social	1.37	0.37	0.92	1.23	0.80	0.82	0.92	0.46	0.67	17
sleep	-0.80	-0.37	-0.04	-0.63	-0.20	-0.54	0.08	0.21	-0.33	50

Table 19

Wilks MANOVA on the Seven Pain Variables Comparing the Cognitive, Somatic and Combined Treatment Groups

	value	F	error DF	P
Treatment main effect				
	0.44	0.44	12	0.927
Time main effect				
	0.24	2.69	36	0.008
Treatment by Time interaction				
	0.08	2.34	66	0.002

Table 20

Treatment by Time Interaction Individual ANOVAs on Pain Variables Comparing the Cognitive, Somatic and Combined Treatment Groups+

	Hypothesis MS	error MS	F
usual	200.07	223.75	0.89
least	49.46	60.01	0.82
most	462.82	296.22	1.56
sensory	28.98	14.19	2.04
affective	2.27	1.86	1.22
evaluative	3.33	0.81	4.12*
Moos pain	5.40	5.07	1.06

\+ df=4,24

* $p < 0.011$

Figure 8
Treatment by Time Interaction Comparing the Cognitive, Somatic and Combined Treatment Groups on Evaluative Pain

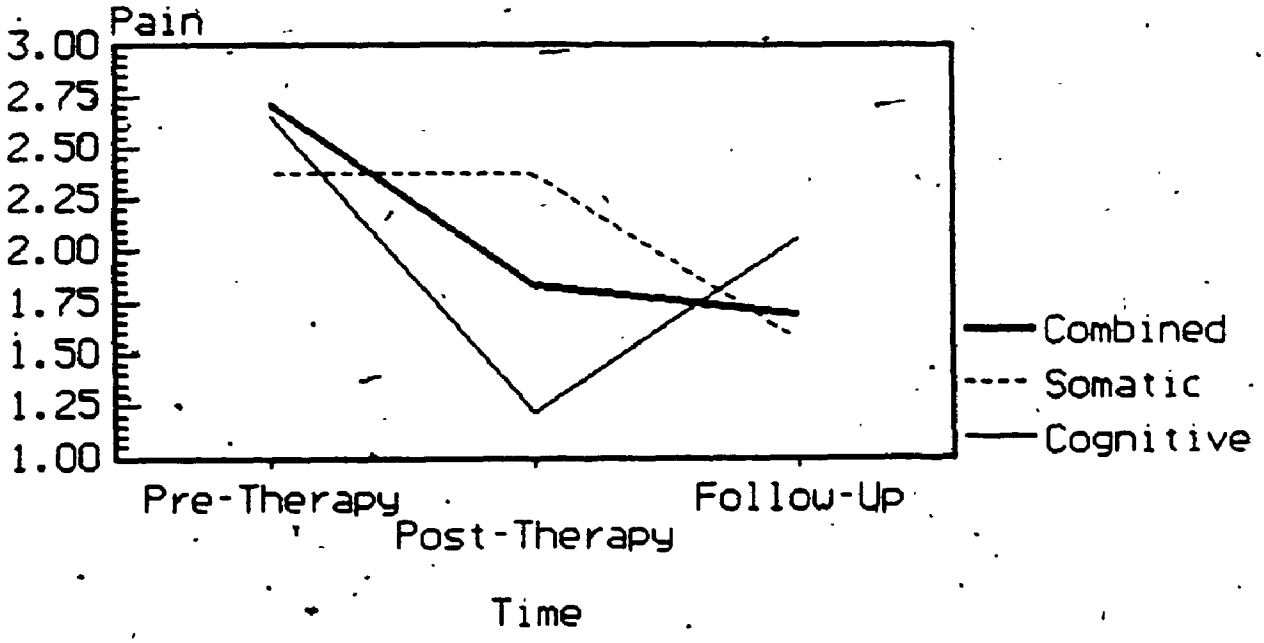


Table 21

A Posteriori Comparisons on Evaluative Pain Means, Using Duncan's Multiple Range Test

Pre-treatment:	
cognitive vs. combined	Not Sig.
somatic vs. combined	Not Sig.
cognitive vs. somatic	Not Sig.
Post-treatment:	
cognitive vs. combined	Not Sig.
somatic vs. combined	Not Sig.
cognitive vs. somatic	Significant
Follow-up:	
cognitive vs. combined	Not Sig.
somatic vs. combined	Not Sig.
cognitive vs. somatic	Not Sig.

than the somatic subjects on this variable. There is also a non-significant trend for the women in the cognitive group to benefit more than the women in the combined treatment group, and for the women in the combined treatment group to benefit more than the women in the somatic group. By follow-up, no significant differences were found. However, there was a trend in the data for the women in the combined treatment group to benefit from therapy more than women in the cognitive group.

The results of the MANOVA performed on the six non-pain variables are presented in Table 22. There is a significant time main effect but no significant treatment by time interaction or treatment main effect. Individual ANOVAs showed that except for Moos negative affect, all variables were reduced over time (see Appendix O). For completeness, the MANOVA was repeated adding the five Moos scales that were not expected to show changes (Table 23). As can be seen, the results are similar to those found in Table 22.

Medication Changes After Treatment

None of the women in the cognitive or combined treatment groups increased their medication use after treatment. In addition, two women in the cognitive group and four in the combined group reduced medication use, after treatment, to no medication at all. In the somatic group, while some of the women decreased their medication use after treatment, some of the women even increased their medication use, and none of the women in the group reduced medication intake to none at all.

Using drug equivalence tables culled from a variety of medical texts (e.g., Hebert, Morvan & Bourgouin, 1986; Pruss, Gardocki, Taylor

Table 22

Repeated Measures Wilks Manova on the Six Non-Pain Variables Comparing the Cognitive, Somatic and Combined Treatment Groups

	value	F	error DF	P
Treatment main effect				
	0.18	1.55	14	0.214
Time main effect				
	0.14	7.30	7	0.010
Treatment by Time interaction				
	0.19	1.48	14	0.241

Table 23

Repeated Measures Wilks MANOVA on the Eleven Non-Pain Variables Comparing the Cognitive, Somatic and Combined Treatment Groups

	value	F	error DF	P
Treatment main effect				
	0.00	2.75	4	0.168
Time main effect				
	0.08	3.26	28	0.002
Treatment by Time interaction				
	0.05	1.48	55	0.082

& Muschek, 1980), medication use was standardized by converting each dosage of each medication to its equivalent in mgs of analgesic. Oral contraceptives were not included in the calculation of medication use due to the lack of quantifiable information on their pain-relieving properties. However, as stated earlier (in treatment effects section), the women in the three groups did not differ significantly in their use of oral contraceptives.

Using the standardized drug scores, women in the cognitive treatment group significantly reduced their medication use ($p=0.02$) from pre- to post-treatment, and women in the combined treatment group significantly reduced their medication use ($p=0.05$) from pre-treatment to follow-up. These reductions were over 50%, while the reductions in medication use by the women in the somatic and wait-list control groups were small (14-15%) and not significant ($p=0.30$ to $p=0.33$).

These converted scores were then compared at baseline (cognitive, somatic, wait-list groups) post-treatment (cognitive, somatic, wait-list and cognitive, somatic, combined) and follow-up (cognitive, somatic, combined) using ANOVAs (see Tables 24 & 25, and Figures 9 & 10). The three groups did not differ significantly before or immediately after treatment. However, by follow-up, there were significant differences among them with the groups receiving the combined treatment using less medication than the somatic groups (Table 26).

Correlations between pain- and discomfort-change scores and medication-use change scores were calculated to investigate the possibility that providing treatment can counteract a reduction in

Table 24

Mean Drug Use in mg of Analgesic

	Baseline		Post-Treatment		Follow-up	
	mean	SD	mean	SD	mean	SD
cognitive	3833	2237	1839	1210	2292	1280
somatic	2919	2617	2496	2384	3920	2532
wait-list*	1976	1582	1672	777		
combined**	1976	1582	972	669	567	388

* For the wait-list group, post-treatment is the mean of baseline periods 3 & 4 of the wait-list period

** The baseline for the combined treatment group is the mean of periods 1 & 2 of the baseline (wait-list) period

Table 25

ANOVAs on Drug Use Comparing the Cognitive, Somatic and Combined Treatment Groups

	Sum of squares	Mean squares	df	F ratio	F probability
baseline:					
between groups	8371855	4185927	2	0.8383	0.4563
within groups	59919162	4993263	12		
post-treatment:					
between groups	5160791	2580395	2	0.9865	0.4012
within groups	31388493	2615708	12		
follow-up:					
between groups	22501032	11250516	2	4.2889	0.0452
within groups	26231454	2623145	12		

Figure 9
Drug Use in Milligrams of Analgesic
(For Wait-list post-therapy is mean of baseline 3&4)

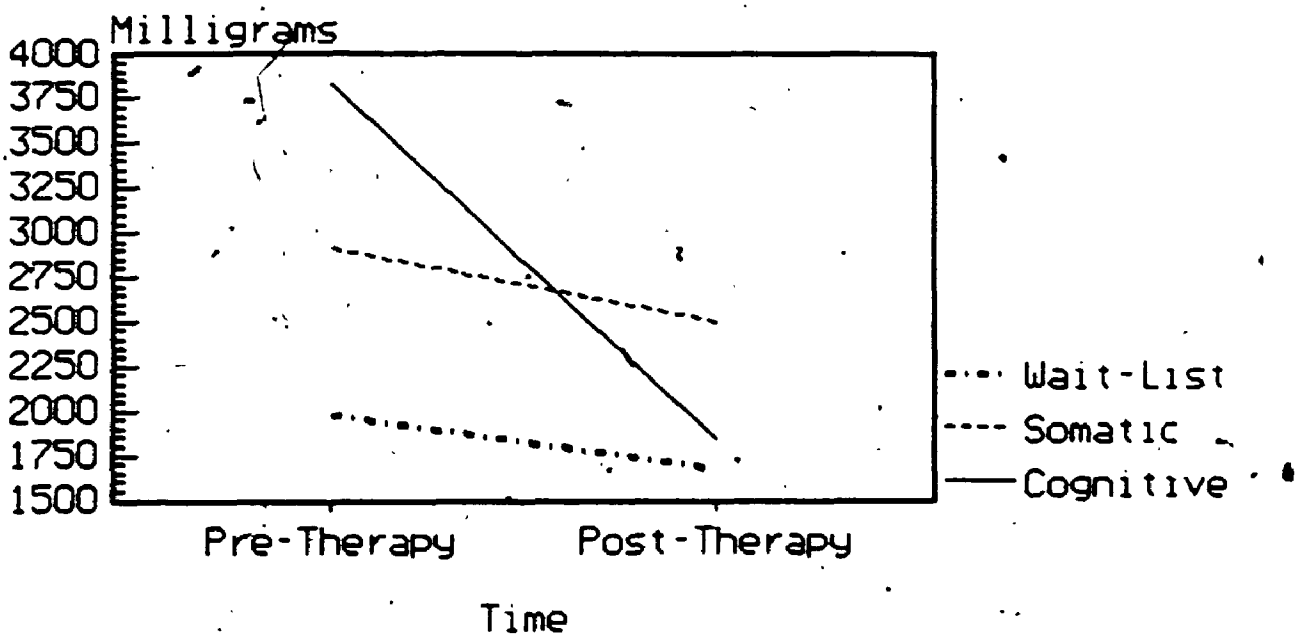


Figure 10
Drug Use in Milligrams of Analgesic

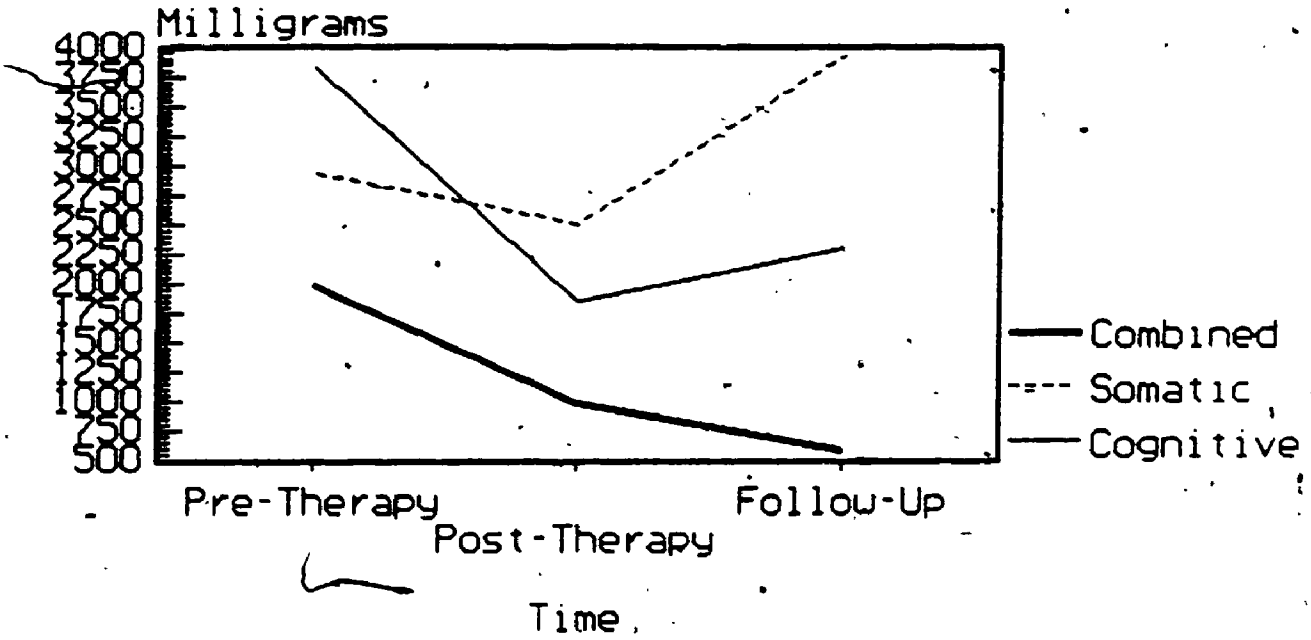


Table 26

A Posteriori Comparisons on Drug Use Using Duncan's Multiple Range Test

follow-up:

cognitive vs combined	Not Sig.
somatic vs combined	Significant
cognitive vs somatic	Not Sig.

medication-use. Five correlations were significant at the 0.05 level or better and two were marginally significant. As expected, almost all the significant correlations (six out of seven) were positive (see Table 27). This indicates that a reduction in pain and discomfort following treatment occurs together with a decrease or no change in medication use, and not with an increase.

Does Matching Make a Difference?

Before treatment, subjects rated the degree to which they expected treatment for dysmenorrhea to be cognitively or somatically oriented. Half of the women expected a cognitive orientation and half a somatic orientation. After random assignment to groups, seven women in the cognitive group were matched (i.e., had a cognitive expectation and were in a cognitive group) and eight women were mismatched. For the somatic group, seven were matched and eight mismatched, as well. Comparing the women who were matched to those who were mismatched, none of the interactions was significant nor was there a significant matching main effect (see Table 28). For completeness, the analysis was repeated using all eleven non-pain variables. There was no significant interaction using this analysis either; however, there was a significant matching main effect (see Table 29). The main effect was significant for sleep interference (see Table 30). The women whose expectations matched their treatment experienced less sleep interference than those who were mismatched. None of the interactions or matching main effect was significant when using the pain variables (see Table 31).

Table 27

Correlations Between Outcome Change Scores and Medication Use Change Scores

	dependent variable change scores from pre to post+		dependent variable change scores from pre to follow-up++	
	correlation	p value	correlation	p value
average pain	0.11	0.265	0.17	0.221
least pain	0.27	0.059	0.29	0.089
most pain	0.02	0.464	0.12	0.289
sensory pain	0.04	0.404	0.33	0.065
affective pain	-0.33	0.026	0.12	0.289
evaluative pain	0.19	0.129	0.24	0.133
Moos pain	0.17	0.153	0.55	0.003
Moos affective	-0.03	0.440	0.14	0.269
Moos behavior	0.43	0.004	0.17	0.214
time missed	0.26	0.062	0.03	0.447
productivity	0.12	0.250	0.51	0.007
social	0.02	0.462	0.29	0.092
sleep	0.27	0.057	0.49	0.009

+ pre to post change scores are calculated by subtracting the pre scores from the post scores

++ pre to follow-up change scores are calculated by subtracting the pre scores from the follow-up scores

Table 28

Wilks MANOVA on the Six Non-Pain Variables Comparing Matched and Mismatched Subjects

	value	F	error	P
Matching main effect				
	0.714	1.204	18	0.349
Treatment by Matching interaction				
	0.623	1.818	18	0.152
Time by Matching interaction				
	0.389	1.572	12	0.222
Time by Treat by Matching interaction				
	0.361	1.769	12	0.168

Table 29

Wilks MANOVA on the Eleven Non-Pain Variables Comparing Matched and Mismatched Subjects

	value	F	error	P
Matching main effect				
	0.268	3.233	13	0.024
Treatment by Matching interaction				
	0.421	1.621	13	0.202
Time by Matching interaction				
	0.497	1.371	72	0.159
Time by Treat by Matching interaction				
	0.603	0.942	72	0.543

Table 30

Matching Main Effect Individual ANOVAs on the Eleven Non-Pain Variables

	Mean squares	error mean squares	F ratio	F probability
Moos-retention	19.290	27.033	0.714	0.407
Moos-autonomic	1.201	7.171	0.167	0.686
Moos-affective	111.071	41.860	2.653	0.117
Moos-concentration	27.068	30.618	0.884	0.357
Moos-behavior	18.746	17.715	1.058	0.314
Moos-arousal	0.842	14.122	0.060	0.809
Moos-control	6.311	3.820	1.652	0.211
time-missed	0.038	1.164	0.033	0.857
productivity	0.779	0.909	0.855	0.365
social	0.810	1.727	0.469	0.500
sleep	5.000	1.130	4.423	0.047

Table 31

Wilks MANOVA on the Seven Pain Variables Comparing Matched and Mismatched Subjects

	value	F	error DF	P
Matching main effect				
	0.628	1.441	17	0.253
Treatment by Matching interaction				
	0.701	1.033	17	0.444
Time by Matching interaction				
	0.460	0.840	14	0.628
Time by Treat by Matching interaction				
	0.627	1.502	80	0.130

Shifts in matching were examined by comparing pre-therapy treatment expectation ratings to post-therapy ratings. This examination revealed that 67% of the women became more "matched", i.e., expected treatment for dysmenorrhea that was congruent with what they received, while only 27% became more mismatched.

Factoring Pain and Discomfort Variables

Exploratory factor analyses were performed to examine the structure of the data. Specifically, these analyses were performed to ascertain if the dependent measures were correlated, and if they could be meaningfully grouped together. These analyses utilized principal components analysis with varimax rotation and extracted all factors with an eigenvalue greater than 1. They converged in three iterations and used the Kaiser normalization.

The first factor analysis was performed on the pre-treatment values of the seven pain measures to extract main factors. Two main pain factors were extracted (Table 32). These factors accounted for 69% of the pre-treatment pain variance (Table 33). Factor loadings were over 0.71. The first factor was labeled the evaluation component of the pain and the second was labeled the sensory/affective component.

Using the six non-pain variables, in the second factor analysis, two main factors were extracted (Table 34). These factors accounted for 70% of the pre-treatment variance (Table 35). Factor loadings were over 0.54. The first factor was named the behavioral effect, and the second was named the physiological/emotional effect.

Table 32

Factor Loadings for the Seven Pain Variables Using a Rotated Factor Matrix

	Factor 1	Factor 2
usual	0.859*	0.249
most	0.803*	0.292
least	0.746*	0.112
sensory	0.347	0.859*
affective	0.219	0.767*
evaluative	0.714*	0.212
Moos-pain	0.127	0.826*

* Indicates the highest factor loading for that variable

Table 33

Pain Factors

	Eigenvalue	Percent of Variance
Factor 1 Evaluative pain	3.70	52.8
Factor 2 Sensory/ affective	1.15	16.4
Total		69.2

Table 34

Factor Loadings for the Six Non-Pain Variables Using a Rotated Factor Matrix

	Factor 1	Factor 2
Moos-affective	0.557	0.707*
Moos-behavior	0.882*	-0.229
time missed	0.456	-0.538*
productivity	0.866*	-0.148
social	0.834*	-0.029
sleep	-0.242	0.746*

* Indicates the highest factor loading for that variable

Table 35

Discomfort Factors

	Eigenvalue	Percent of Variance
Factor 1 Behavioral effect	2.90	48.4
Factor 2 Physiological/ emotional	1.32	22.0
Total		70.4

GENERAL DISCUSSION

Limitations of the Study

In Study 1, the participants expressed a need for a brief psychological treatment for dysmenorrhea. Therefore, treatment duration in Study 3 was kept to only eight hours. However, eight hours may not be sufficient for a treatment of this disorder. Perhaps extending the treatment to twelve or even fifteen hours would be more beneficial. In addition, one therapist led all treatment groups. Although the therapist was experienced in working with individuals and groups, and with a wide range of disorders, she had never led a treatment group for dysmenorrheic women prior to leading the groups in this study. Furthermore, the treatment was provided in a university classroom, as opposed to a clinic or hospital. Although none of the participants expressed concerns regarding the setting, it may have influenced women to see this study as experimental research rather than as clinical treatment. Finally, it is important to recognize that individual differences in beliefs about treatment, success in acquiring the requisite skills, adherence to treatment, and ability to benefit from treatment may have increased the variability in the groups. So, too, would the inherent month-to-month fluctuation in dysmenorrhea pain. Increased variability decreases the likelihood of finding a significant treatment effect. These issues may limit generalizability of the results (or lack of them) to other therapists and settings.

Prior to treatment, there was only one significant difference between the groups on the outcome variable, time missed. There were no significant differences between women who completed the treatment

and those who dropped out. Initial examination of the data revealed that the orientation of the treatment groups was accurately perceived by the subjects as well as by the blind raters as being cognitive in the cognitive group and somatic in the somatic groups. Therefore, any differences between the groups at post-treatment are likely to be due to the treatment.

Treatment Effects

All three groups (cognitive, somatic, wait-list) improved after manipulation. This improvement was seen on all pain and most non-pain variables. Aside from time missed, there were no pre-treatment differences among the groups. There was a significant interaction which stemmed from differential improvement after manipulation. For sensory pain, evaluative pain, Moos-behavior and social interference, the women in the cognitive group improved more than those in the somatic group. There was a non-significant trend for the women in the cognitive group to display a larger reduction on evaluative pain and social interference, after treatment, than women in the wait-list control group displayed after waiting. In addition, the women in the wait-list control group evidenced a greater reduction in sensory pain, after the waiting period, than women in the somatic group displayed after treatment.

Taken together, these results suggest a moderate treatment effect for the cognitive therapy group which is larger (but not significantly so) than the changes in the wait-list control group, and a treatment effect for the somatic group which was smaller than the improvement the women in the wait-list group experienced after waiting for treatment.

On time missed, there were pre-treatment differences among the groups with women in the wait-list control group displaying the smallest degree of interference. After treatment, the women in the cognitive group experienced a large reduction in the degree the pain affected the time they missed from school or work, so that there was no longer a difference between the cognitive group and the wait-list control group. If not for the fact that the wait-list control group reduced the time they missed from school or work (after the waiting period) to none at all, finding that the difference between the cognitive and wait-list group disappeared after manipulation could be interpreted to mean that the women in the cognitive group improved more than the women in the other two groups.

Not finding a significant treatment effect for the somatic group, leads one to the conclusion that relaxation which is tailored to dysmenorrheic women, and combined with a practice component, is not effective for this population. Tailoring relaxation to dysmenorrhea was assumed to be preferable to general relaxation following Denney and Gerrard's (1981) argument that tailoring biofeedback to dysmenorrhea is preferable to biofeedback which uses a site removed from the pain source.

Only one study utilized specific relaxation, and found it to be beneficial when combined with cognitive elements (Quillen & Denney, 1982). General relaxation combined with biofeedback or cognitive elements was found to be beneficial as well (Bennink et al., 1982; Heczey, 1980; Polson, 1981). No study was found that examined specific relaxation without combining it with cognitive elements. The results of controlled studies examining the utility of general

relaxation for dysmenorrhea are contradictory, with two finding that relaxation was beneficial (Heczey, 1980; Polson, 1981) and two that it was no better than a control group (Bennink et al., 1982; Rosenthal, 1978). The two studies that used autogenic training found an effect for relaxation and those using muscle relaxation did not. Therefore, although it is possible that autogenic training is superior to muscle relaxation for dysmenorrheic women, it seems likely that both specific and general relaxation are maximally beneficial only when combined with cognitive elements or with biofeedback. However, in this study the combined treatment group did not benefit from treatment more than the somatic group. Previously, (dysmenorrhea - etiology section), it was pointed out that prostaglandins are presumed to create pain during menstruation by both increasing muscle contractions and sensitizing the pain receptors. Relaxation may counteract muscle contractions, but not the sensitizing effect, whereas cognitive treatment may counteract both effects. This may partially account for the finding that cognitive treatment was superior to somatic treatment for this population.

The results for the cognitive treatment are surprising in light of the widespread use of cognitive and cognitive-behavioral treatment (CBT) for pain problems (see Turk et al., 1983, for a review). Only two studies are reported in the literature which utilized a form of cognitive therapy with dysmenorrheic women. One study compared a cognitive treatment (rational-emotive therapy, assertiveness training and historical review) to a somatic treatment (relaxation training, biofeedback and exercise) and to a control group and found no

differences between the groups (DeWitt, 1981). However, this may have been due to the small sample sizes used, and the lack of pain control procedures (e.g., distraction) in the treatment. The second study compared the cognitive treatment (cognitive restructuring of negative self-statements) to a combined treatment group (adding relaxation-desensitization) and found that women in both treatment groups were slightly more improved than women in the control group, and the two treatment groups were not different (Duson, 1977). Therefore, previous research is inconclusive about the benefit of cognitive treatment for dysmenorrhea. This study tentatively suggests that perhaps cognitive therapy is not advantageous to this population.

However, the lack of large treatment differences may be due to the large improvement that occurred in the wait-list control group during their waiting period. Women in this group rated significantly less interference from pain on 9 out of 13 variables ($\alpha < 0.05$). Using stringent criteria (dividing the α by the number of variables), 3 variables were significantly reduced during the baseline period. Additionally, reductions of approximately 50% were evidenced in three variables after the waiting period. The change in the wait-list group is astounding, especially when we consider that the women in this study had been suffering from dysmenorrhea for an average of 13 years. Long-standing dysmenorrhea is unlikely to remit solely due to passage of time. Clearly, the control group manipulation was reactive.

The improvement in the wait-list control group could be interpreted as operating via the expectation of improvement. In this study, all subjects were informed that they were to receive an active treatment. Therefore, it is likely that they expected to improve

after treatment, and that this positive expectation reduced their level of anxiety, stress and negative affect. Previously (in contributing factors section) it was pointed out how elevations or reductions in anxiety, stress and negative affect influence the pain level and the amount of prostaglandins produced, which, in turn, influences degree of felt pain. Therefore, the improvement evidenced in the wait-list control group could be attributed to expectations. Similarly, Goldstein (1962) found that wait-list control groups improved during their waiting period, and Frank (1968a,1968b) found that patients given a placebo displayed most of their improvement (in symptom reduction and mood elevation) during the waiting period.

Nevertheless, if no treatment is forthcoming, the women may lose hope, their affect may become negative, and the positive effects of expectations would wear off and disappear. Due to ethical considerations, the wait-list control group was not left without treatment for longer than the baseline period; therefore, this hypothesis could not be tested. Conversely, the above explanation could be applied to the findings that the women in the somatic treatment group improved less, after treatment, than those in the wait-list control group improved after the waiting period. According to this explanation, the somatic treatment was ineffective; therefore, the initial expectations were not met and the women did not benefit from treatment, whereas women in the wait-list control group were still optimistic that treatment would help them because they had not yet experienced treatment.

An additional explanation for the lack of differences between cognitive treatment and wait-list participants is that treatment

effects were confounded by changes in medication use. Women in the cognitive group significantly reduced their medication use, from pre- to post-treatment by more than 50% while the wait-list and somatic groups reduced medication use only slightly (14-15%). The medication is effective in reducing the symptoms of dysmenorrhea, therefore large reductions in medication will result in an increase in symptomatology. Therefore, the lack of difference in pain and discomfort relief between the wait-list control group and the other two groups (cognitive and somatic), along with the large reduction in medication use in the cognitive group, could be interpreted as an indication that the cognitive treatment was effective in reversing the increase in symptomatology. In addition, finding positive or non-significant correlations rather than negative correlations between improvement on pain and discomfort measures and changes in medication use, supports this hypothesis. If the treatment was ineffective in reducing pain and discomfort, we would expect negative correlations between changes in medication use and outcome measures, i.e., reductions in medication use would be accompanied by increases in pain and/or discomfort. Positive (or non-significant) correlations indicate that reductions in medication use were not accompanied by increases in discomfort. One possible explanation is that the treatment was effective in reversing the trend.

Cognitive versus Somatic versus Combined Treatment

Treatment groups differed at post-treatment on only one variable (evaluative pain). For this variable, the cognitive group improved significantly while the somatic group remained unchanged. There was

also a non-significant trend for the women in the cognitive group to improve more than women in the combined treatment group. This difference disappeared at follow-up. At follow-up there was a non-significant trend for women in both the combined treatment group and the somatic treatment group to benefit more than women in the cognitive treatment group.

Literature on treatment for various pain disorders has established the superiority of combining cognitive and behavior therapy over administering behavior therapy alone or cognitive therapy alone (see Turk et al., 1983). Only two studies utilized a cognitive-behavior therapy approach for dysmenorrhea. One study compared the combined treatment to a control group and found it to be effective (Quillen & Denney, 1982) and the other compared the combined treatment to a somatic treatment and found both to be superior to a control group but not significantly different from each other (Duson, 1977). No studies compared a combined treatment to a cognitive treatment for this population. Therefore, although pain literature in general suggests combining cognitive and somatic elements in treatment for pain, it is premature to conclude that this would be true of dysmenorrhea treatment as well. The present research failed to find significant differences between the combined treatment and the cognitive and somatic treatments. This may be due to lack of effectiveness of all three treatment approaches in this study. Alternatively, it may suggest that there is, in fact, no utility to combining somatic and cognitive elements in therapy.

However, changes in medication use may have masked differences between the groups. In the somatic group, there was a slight decrease

in medication use after treatment, and an increase above pre-therapy levels at follow-up. In contrast, the cognitive and combined groups reduced medication use at post-treatment, the cognitive group maintained most of this decrease at follow-up, and the women in the combined group reduced medication use even further. Perhaps the somatic treatment was ineffective in reducing pain and discomfort and, thus, no real reduction in medication occurred, whereas the cognitive and combined treatments were effective and, therefore, women could reduce their medication use accordingly. Likewise, the combined treatment groups and cognitive treatment groups did not differ in medication use reduction after treatment. However, at follow-up the women in the cognitive groups increased slightly, whereas women in the combined groups reduced their medication use even further. Thus, perhaps the combined treatment was, in fact, more effective than the cognitive treatment.

Matching

No matching effect was found for the pain or the non-pain variables. The only difference found was due to mismatched women experiencing more sleep interference overall than matched women.

In this study, women were "indoctrinated" into the treatment. In the first session, they were provided with a rationale that was tailored to the treatment they received. This rational described the causes for their pain and discomfort and the treatment that was provided. Perhaps providing this rationale served to change their orientation, so that matching or mismatching was no longer important. Accordingly, post-treatment testing revealed that the majority of the

women (67%) became more "matched", i.e., expected treatment for dysmenorrhea to be similar to what they received. Strong (1968) suggests that clients can reduce their dissonance in treatment by changing their opinion (orientation). Perhaps that is what occurred in this study. Similarly, Benbenishty and Schul (1987) found that clients' and therapists' expectations of role behaviors and content become more similar as therapy progresses. Finally, Heitler (1976) found a beneficial effect for preparing patients for therapy.

Suggestions for Future Research

Future research can attempt to assess the importance of matching by comparing mismatched and matched women who are provided with a rationale, to those who are not. If providing a rationale overrides the matching effect (as is proposed in this study), then matched women with or without a rationale and mismatched women with a rationale should all benefit equally, while mismatched women without a rationale would improve less. If, however, providing a rationale does not override the matching effect, then matched women, with or without a rationale, should improve more than mismatched women. Finally, if matching and providing a rationale have cumulative effects, then the group who are both matched and receive a rationale should improve the most, and the mismatched group without a rationale, the least.

Future research should also attempt to assess the relative contributions of medication and treatment by either requesting women to maintain their medication levels constant throughout the study, or by accepting only women who are not using any medications.

In future research, longer baseline periods should be used, to enable all groups to evidence the reduction in pain and discomfort

that occurred in the wait-list control group during their third and fourth baseline periods.

Factoring Pain and Non-Pain Variables

Although not one of the hypotheses in this study, the factor structure of the dependent variables was examined. Two main pain factors (evaluative pain and sensory/affective pain) and two non-pain factors (behavior interference and physiological/emotional interference) were extracted. These factors explain a large degree of variability in the results. Therefore, the dependent variables are in fact correlated and can be meaningfully grouped into factors.

It is interesting to note that the three non-pain variables which differentiated between the cognitive and somatic treatment groups all loaded on the behavior interference factor, and not the physiological/emotional factor, suggesting that the effects of the cognitive treatment, in this study, operated through specific behavioral changes.

Summary and Conclusions

Women in all three groups evidenced large and significant reductions in their pain and discomfort ratings after treatment. In addition, the women in the cognitive group improved more than the women in the somatic group and there were trends for the women in the cognitive group to improve more after treatment than women in the wait-list group improved after the wait-list period. According to pain and discomfort measures, the hypothesis that women undergoing treatment would suffer less pain and discomfort after treatment than women in a wait-list control group would after the wait-list period,

was only supported by non-significant trends. The hypothesis that a combined treatment would be superior to a cognitive or a somatic treatment was not supported. Even though the use of medication was not discussed in treatment, large reductions in the amount of its use were evidenced in the cognitive and combined treatment groups and not in the somatic or wait-list control groups. This finding suggests that the cognitive and combined treatment approaches were superior to the somatic treatment and wait-list control manipulation. We are, therefore, faced with an inconsistency in the data. Self-report pain and discomfort measures were reduced over time but did not differentiate between treated and untreated subjects. However, self-reported medication use was reduced in the cognitive and combined treatment groups and not in the somatic or wait-list control groups. Medication report is easier to quantify and report, and, thus, less vulnerable to biases in reporting. Therefore, at least equal if not more credence should be given to the finding of reductions in medication. Similarly, Wells (1985) suggests relying on changes in medication use rather than changes in ratings of pain on the visual analogue scale or the McGill pain questionnaire for patients who are using medication to control their pain.

The third hypothesis stated that matched women would benefit more from treatment than mismatched women. No matching effect was found; therefore, this hypothesis was not supported. Lack of support for this hypothesis may stem from lack of treatment effects or from the provision of a rationale in the first session, which may have changed the participants' orientation and expectations from treatment.

REFERENCES

Aberger, E. W., Denney, D. R., & Hutchings, D. F. (1983). Pain sensitivity and coping strategies among dysménorrheic women: Much ado about nothing. Behavioral Research and Therapy, 21, 119-127.

Alvin, P. E., & Litt, I. F. (1982). Current status of the etiology and management of dysmenorrhea in adolescence. Pediatrics, 70, 516-525.

Ammerman, R. T., & Hersen, M. (1986). Effects of scene manipulation on role-play test behavior. Journal of Psychopathology and Behavior Assessment, 8, 55-67.

Andersch, B., & Milsom, I. (1982). An epidemiologic study of young women with dysmenorrhea. American Journal of Obstetrics and Gynecology, 144, 655-660.

Asso, D. (1983). The real menstrual cycle. New-York: John Wiley & Sons.

Astrachan, J.M. (1981). Psychiatric treatment of primary dysmenorrhea. In M.Y. Dawood (Ed.), Dysmenorrhea. Baltimore: Williams & Wilkins.

Badawy, S. Z. A., Rebescher, F., Kohn, L., Wolfe, H., Oates, R. P., & Moses, A. (1983). Steroidal contraceptive use and subsequent development of hyperprolactinemia. In S. Golub (Ed.). Menarche: The transition from girl to woman (pp. 263-266). Lexington, Massachusetts: Lexington Books.

Baekland, F., & Lundwall, L. (1975). Dropping out of treatment: A critical review. Psychological Bulletin, 82, 738-783.

Balick, L., Elfner, L., May, J., & Moore, J. D. (1982). Biofeedback treatment of dysmenorrhea. Biofeedback and Self Regulation, 7, 499-519.

Benbenishty, R. (1987). Gaps between expectations and perceived reality of therapists and clients. Journal of Clinical Psychology, 43, 231-236.

Benbenishty, R., & Schul, Y. (1987). Client-therapist congruence of expectations over the course of therapy. British Journal of Clinical Psychology, 26, 17-24.

Ben-Menachem, M. (1980). Treatment of dysmenorrhea: A relaxation therapy program. International Journal of Gynecology and Obstetrics, 17, 340-342.

Bennink, C. D., Hulst, L. L., & Benthem, J. A. (1982). The effects of EMG biofeedback and relaxation training on primary dysmenorrhea. Journal of Behavioral Medicine, 5, 329-341.

Bloom, L. J., Shelton, J. L., & Michaels, A. C. (1978). Dysmenorrhea and personality. Journal of Personality Assessment, 42, 272-276.

Borgeat, F., Stravynski, A., & Chaloult, L. (1983). The influence of two different sets of information and suggestions on the subjective effects of relaxation. Journal of Human Stress, 9, 40-45.

Borkovec, T. D. (1972). Effects of expectancy on the outcome of systematic desensitization and implosive treatments for analogue anxiety. Behavior Therapy, 3, 29-40.

Borkovec, T. D. (1973). The role of expectancy and physiological feedback in fear research: A review with special reference to subject characteristics. Behavior Therapy, 4, 491-505.

Bradley, B. W., & McCanne, T. R. (1981). Autonomic responses to stress: The effect of progressive relaxation, the relaxation response and expectancy of relief. Biofeedback and Self-Regulation, 6, 235-251.

Breckenridge, L. E. (1981). The effects of thermal biofeedback and transcutaneous electrical nerve stimulation (TENS) treatment of dysmenorrhea. (Doctoral dissertation, Florida State University, 1981). Dissertation Abstracts International, 42, 2517B.

Chan, W. Y. (1983a). Prostaglandins in primary dysmenorrhea: Basis for the new therapy. In S. Golub (Ed.). Menarche: The transition from girl to woman. (pp 243-249). Lexington, Massachusetts: Lexington Books.

Chan, W. Y. (1983b). Prostaglandins and non-steroidal antiinflamatory drugs in dysmenorrhea. Annual Review of Pharmacology and Toxicology, 23, 131-149.

Chesney, M. A., & Tasto, D. L. (1975). The effectiveness of Behavior Modification with spasmodic and congestive dysmenorrhea. Behavior Research and Therapy, 13, 245-253.

Collins, J. & Hyer, L. (1986). Treatment expectancy among psychiatric inpatients. Journal of Clinical Psychology, 42, 562-569.

Cox, D. J., & Meyer, R. G. (1978). Behavioral treatment parameters with primary dysmenorrhea. Journal of Behavioral Medicine, 1, 297-310.

Cox, D. J., & Santirocco, L. L. (1981). Psychological and behavioral factors in dysmenorrhea. In M.Y. Dawood (Ed.) Dysmenorrhea (pp. 75-93). Baltimore: Williams & Wilkens.

Danforth, D. N. (1982). Obstetrics and gynecology (4th ed.). Philadelphia: Harper & Row.

Dawood, M. Y. (1981) Hormones, prostaglandins and dysmenorrhea. In M.Y. Dawood (Ed.), Dysmenorrhea (pp. 21-52). Baltimore: Williams & Wilkins.

Dawood, M.Y. (1985). Overall approach to the management of dysmenorrhea. In M.Y. Dawood, J.L. McGuire & L.M. Demers (Eds.). Premenstrual syndrome and dysmenorrhea (pp. 177-204). Baltimore: Maryland, Urban & Schwarzenberg.

DeGood, D. E., Elkin, B., Lessin, S., & Valle, R. S. (1977). Expectancy influence on self-reported experience during alpha feedback training. Biofeedback and Self-Regulation, 2, 183-194.

Delaney, J., Lupton, M. J., & Toth, E. (1976). The curse. New-York: Dutton.

Demers, L. M., Hahn, D. W., & McGuire, J. L. (1985). Newer concepts in dysmenorrhea research: Leukotrienes and calcium channelblockers in M. Y. Dawood, J. L. McGuire & L. M. Demers (Eds.). Premenstrual syndrome and dysmenorrhea. Baltimore: Maryland, Urban & Schwarzenberg.

Denney, D. R., & Gerrard, M. (1981). Behavioral treatments of primary dysmenorrhea: A review. Behavior Research and Therapy, 19, 303-312.

DeWitt, P. H. (1981). Comparison of group training procedures for coping with menstrual distress. (Doctoral dissertation, Purdue University, 1980). Dissertation Abstracts International, 42, 2049B-2050B.

Dietvorst, T. F., & Osborne, D. (1978). Biofeedback-assisted relaxation training for primary dysmenorrhea: A case study. Biofeedback and Self Regulation, 3, 301-305.

Dorcus, R. M., & Kirkner, F. J. (1948). The use of hypnosis in the suppression of intractable pain. Journal of Abnormal and Social Psychology, 43, 237-239.

Duckro, P., Beal, D., & George, C. (1979). Research on the effects of disconfirmed client role expectations in psychotherapy: A critical review. Psychological Bulletin, 86, 260-275.

Duson, B. M. (1977). Effectiveness of relaxation-desensitization and cognitive restructuring in teaching the self-management of menstrual symptoms to college women. Dissertation Abstracts International, 37, 6322B.

Frank, J. (1968a). The influence of patients' and therapists' expectations on the outcome of psychotherapy. British Journal of Medical Psychology, 41, 349-356.

Frank, J. (1968b). The role of hope in psychotherapy. International Journal of Psychiatry, 5, 936-938.

Friedlander, M. (1982). Expectations and perceptions of counseling: Changes over time and in relation to verbal behavior. Journal of College Students Personnel, 23, 402-408.

Garfield, S. L., & Wolpin, M. (1963). Expectations regarding psychotherapy. Journal of Nervous and Mental Diseases, 137, 353-362.

Goldstein, A. P. (1960). Therapist-patient expectancies in psychotherapy. New-York: Pergamon Press.

Goldstein, A. P. (1962). Participant expectancies in psychotherapy. Psychiatry, 25, 72-79.

Hardin, S. I., & Subich, L. M. (1985). A methodological note: Do students expect what clients do? Journal of Counseling Psychology, 32, 131-134.

Hart, A. D., Mathisen, K. S., & Prater, J. S. (1981). A comparison of skin temperature and EMG training for primary dysmenorrhea. Biofeedback and Self Regulation 6, 367-373.

Hebert, J. G., Morvan, P., & Bourgouin, J. (1986). Double-blind comparison of Ketoprofen and Mefenamic Acid in the treatment of primary dysmenorrhea. Clinical Therapeutics, 18, 329-335.

Heczey, M. D. (1977). Effects of biofeedback and autogenic training on menstrual experiences: Relationships among anxiety, locus of control and dysmenorrhea (Doctoral Dissertation, City University of New-York, 1977). Dissertation Abstracts International, 38, 5571B.

Heczey, M. D. (1980). Effects of biofeedback and autogenic training on dysmenorrhea. In A.J. Dan, E.A. Graham & C.P. Beecher (Eds.). The menstrual cycle, Vol. 1. (pp. 283-291). New-York: Springer Publishing.

Heilbrun, A. B. (1972). Effects of briefing upon client satisfaction with initial counseling contact. Journal of Consulting and Clinical Psychology, 38, 50-56.

Heine, R. W., & Trosman, H. (1960). Initial expectations of the doctor-patient interaction as a factor in continuance in psychotherapy. Psychiatry, 23, 275-278.

Heitler, J. B. (1976). Preparatory techniques in initiating expressive psychotherapy with lower-class, unsophisticated patients. Psychological Bulletin, 83, 339-352.

Henzl, M. R. (1980). Treatment of dysmenorrhea. In Prostaglandins and dysmenorrhea: New awareness, new understanding, new therapy - the first multi-center telemed symposium, (pp. 13-19). Canada: Syntex.

Hirt, M., Kurtz, R., & Ross, W.D. (1967). The relationship between dysmenorrhea and selected personality variables. Psychosomatics, 8, 350-353.

Hubert, L. (1977). Kappa revisited. Psychological Bulletin, 84, 289-297.

Hyde, J. S. (1986). Understanding human sexuality, (3rd ed.). New-York: McGraw Hill.

Iacono, C. U., & Roberts, S. I. (1983). The dysmenorrhea personality: Actuality or statistical artifact. Social Science and Medicine, 17, 1653-1655.

Jacobs, D., Charles, E., Jacobs, T., Weinstein, H., & Mann, D. (1972). Preparation for treatment of the disadvantaged patient: Effects on disposition and outcome. American Journal of Orthopsychiatry, 42, 666-673.

Jordan, J., & Meckler, J. R. (1982). The relationship between life change events, social supports, and dysmenorrhea. Research in Nursing and Health, 5, 73-79.

Kroger, W. S., & Freed, S. C. (1943) The psychosomatic treatment of functional dysmenorrhea by hypnosis: A preliminary report. American Journal of Obstetrics and Gynecology, 46, 817-822.

Lewis, R. J., Wasserman, E., Denney, N. W., & Gerrard, M. (1983). The etiology and treatment of primary dysmenorrhea: A review. Clinical Psychology Review, 3, 371-389.

Lick, J., & Bootzin, R. (1975). Expectancy factors in the treatment of fear: Methodological and theoretical issues. Psychological Bulletin, 82, 917-931.

Mannheimer, J. S., & Whalen, E. C. (1985). The efficacy of transcutaneous electrical nerve stimulation in dysmenorrhea. The Clinical Journal of Pain, 1, 75-83.

Marini, D. C. (1979). The relationship of stress arousal and stress-prone personality traits to menstrual distress. Dissertation Abstracts International, 39, 3577B.

Martin, P. J., & Sterne, A. L., (1975). Prognostic expectations and treatment outcome. Journal of Consulting and Clinical Psychology, 43, 572-576.

Martin, P. J., Sterne, A. L., & Hunter, M. L. (1976). Share and share alike: Mutuality of expectations and satisfaction with therapy. Journal of Clinical Psychology, 32, 676-683.

McEwen, B. S. (1976). Interactions between hormones and nerve tissue. Scientific American, 235, 48-58.

Melzack, R. (1975). The McGill Pain Questionnaire: Major properties and scoring methods. Pain, 1, 277-299.

Melzack, R. & Wall, P. (1982). The challenge of pain, New-York: Penguin Books.

Merskey, H. (1986). Classification of Chronic Pain. Pain; (Supt. 3).

Moos, R. H. (1985). Perimenstrual symptoms: A manual and overview of research with the Menstrual Distress Questionnaire. Palo Alto, California: Social Ecology Laboratory, Stanford University.

Morrison, J. C. & Nicells, E. T. (1981). Epidemiologic, social and economic aspects of dysmenorrhea. In M.Y. Dawood (Ed.), Dysmenorrhea. (pp. 95-106). Baltimore: Williams & Wilkins.

Mullen, F. G. (1968). The treatment of a case of dysmenorrhea by behavior therapy techniques. The Journal of Nervous and Mental Disease, 147, 371-376

Neighbors, L. E., Clelland, J., Jackson, J. R., Bergman, J. & Orr, J. Jr. (1987). Transcutaneous electrical nerve stimulation for pain relief in primary dysmenorrhea. The Clinical Journal of Pain, 3, 17-22.

Nitassio, P. M. (1980) Behavioral management of dysmenorrhea: An overview. In A. J. Dan, E. A. Graham & C. P. Beecher (Eds.). The menstrual cycle. Vol. 1. (pp. 273-282) New-York: Springer Publishing.

Orne, M. T., & Wender, P. H. (1968). Anticipatory socialization for psychotherapy: Method and rationale. American Journal of Psychiatry, 124, 1202-1212.

Paige, K. E. (1973) Women learn to sing the menstrual blues. Psychology Today, 7, 41-46.

Persson, G. (1976). Non-pharmacological factors in drug treatment of anxiety states. Acta Psychiatrica Scandinavica, 54, 238-247.

Piper, W. E., Wogan, M., & Getter, H. (1972). Social learning theory predictors of termination in psychotherapy. In J. B. Rotter, J. E. Chance & E. J. Phares (Eds.). Application of a social learning theory of personality (pp. 548-553). New-York: Holt, Rinehart and Winston, Inc.

Polson, D. L. (1981). Effects of biofeedback and autogenic training on symptoms of menstrual distress. Dissertation Abstracts International, 42, 2545B.

Price, L. Z., & Iverson, M. A. (1969). Students' perception of counselors with varying statuses and role behaviors in the initial interview. Journal of Counseling Psychology, 16, 469-475.

Pruss, T. P., Gardock, J. F., Taylor, R. J., & Muscheck, L. D. (1980). Evaluation of the analgesic properties of Zomepirac. Journal of Clinical Pharmacology, 20, 216-222.

Quillen, M. A., & Denney, D. R. (1982). Self-control of dysmenorrheic symptoms through pain management training. Journal of Behavior Therapy and Experimental Psychiatry, 13, 123-130.

Quinn, M. (1979). Beliefs and attitudes: Their significance in therapeutics. In E. Peper, S. Ancoli & M. Quinn (Eds.). Mind/body integration: Essential readings in biofeedback (pp. 201-206). New-York: Plenum Press.

Reading, A. E. (1983). The McGill Pain Questionnaire: An appraisal. In R. Melzack (Ed.). Pain measurement and assessment (pp. 55-62). New-York: Raven Press.

Reich, S. K. (1975). The effects of group systematic desensitization on the symptoms of primary dysmenorrhea. Dissertation Abstracts International, 33, 5499A.

Rodin, J. (1976). Menstruation, reattribution and competence. Journal of Personality and Social Psychology, 33, 345-353.

Rosen, G. M. (1974). Therapy set: Its effects on subjects' involvement in systematic-desensitization and treatment outcome. Journal of Abnormal Psychology, 83, 291-300.

Rosen, G. M. (1976). Subjects' initial therapeutic expectancies and subjects' awareness of therapeutic goals in systematic-desensitization: A review. Behavior Therapy, 7, 14-27.

Rosenthal, R. L. (1978). Differential treatment of spasmodic and congestive dysmenorrhea. Dissertation Abstracts International, 39, 1498B.

Rotter, J. B., Chance, J. E., & Phares, E. J. (Eds.). (1972). Applications of a social learning theory of personality. New-York: Holt, Rinehart and Winston, Inc.

Ruble, D. N., & Brooks-Gunn, J. (1982). A developmental analysis of menstrual distress in adolescence. In R. C. Friedman (Ed.), Behavior and the menstrual cycle (pp. 177-198). New-York: Marcel Dekker.

Russ, C. A. (1977). Thermal biofeedback and menstrual distress Dissertation Abstracts International, 37, 4702B-4703B.

Rybstein-Blinchik, E. (1979). Effects of different cognitive strategies on chronic pain experience. Journal of Behavioral Medicine, 2, 93-101.

Sanavio, E. (1981). Expectancies and biofeedback in thermal training. Italian Journal of Psychology, 8, 265-273.

Schwartz, G. E., Davidson, R. J., & Goleman, D. J. (1978). Patterning of cognitive and somatic process in the self regulation of anxiety: Effects of meditation versus exercise. Psychosomatic Medicine, 40, 321-328.

Scott, J., & Huskisson, E. C. (1976). Graphic representation of pain. Pain, 2, 175-184.

Sedlacek, K., & Heczey, M. (1977). A specific biofeedback treatment for dysmenorrhea. Biofeedback and self regulation: Abstracts of papers presented at the eighth annual meeting of the biofeedback society of America, 2, 294.

Shaw, E. R., & Blanchard, E. B. (1983). The effects of instructional set on the outcome of a stress management program. Biofeedback and Self-Regulation, 8, 555-565.

Strong, S. R. (1968). Counseling: An interpersonal influence process. Journal of Counseling Psychology, 15, 215-224.

Tasto, D. L., & Chesney, M. A. (1974). Muscle relaxation treatment for primary dysmenorrhea. Behavior Therapy, 5, 668-672.

Tubbs, W., & Carnahan, C. (1976). Clinical biofeedback for primary dysmenorrhea: A pilot study. Biofeedback and Self Regulation, 1, 323.

Turk, D. C., Meichenbaum, D., & Genest, M. (1983). Pain and behavioral medicine: A cognitive behavioral perspective. New-York: Guilford Press.

Wallston, K. A., Wallston, R. S., & DeVellis, R. (1978). Development of the Multidimensional Health Locus of Control (MHLC) Scales. Health Education Monographs, 6, 160-170.

Walsh, R. N., Budtz-Olsen, I., Leader, C., & Cummins, R. A. (1981). The menstrual cycle, personality, and academic performance. Archives of General Psychiatry, 38, 219-221.

Wells, C. (1985, August). Clinical issues in chronic pain assessment. Paper presented at the annual meeting of the International Association for the Study of Pain. Halifax, Nova-Scotia.

White, P. A., & Wildman, B. G. (1986). Factors related to medical help-seeking in women with menstrual discomfort. Behavior Research and Therapy, 24, 471-474.

Wilkins, W. (1973a). Clients expectancy of therapeutic gain: Evidence for the active role of the therapist. Psychiatry, 36, 184-190.

Wilkins, W. (1973b). Expectancy of therapeutic gain: An empirical and conceptual critique. Journal of Consulting and Clinical Psychology, 40, 69-77.

Wood, C., Larsen, L., & Williams, R. (1979). Social and psychological factors in relation to premenstrual tension and menstrual pain. Australian and New Zealand Journal of Obstetrics and Gynecology, 19, 111-115

Wynn, R. M. (1982). Obstetrics and gynecology: The clinical core (3rd ed.). Philadelphia: Lea & Febiger.

Appendix A

Background Questionnaire

QUESTIONNAIRE

This questionnaire is designed to help us learn more about women's menstrual cycles. The results will be used to develop appropriate treatment strategies. If for any reason you do not want to participate - simply return the questionnaire to us.

Some of the questions will ask you to rate your pain on a line. One side of the line is marked: "no pain at all". The other side is marked: "the most pain imaginable". Please place a mark on the line in the following manner: -|---|---- at the point that best represents your pain.

Please do not write your name on this questionnaire, to ensure confidentiality.

Thank you for your cooperation.

1. Do you usually have pain: (check one or more)

during menstruation____

before menstruation but it stops when menstruation begins____

both before and during menstruation____

pelvic pain not related to menstruation____

no pelvic or menstrual pain____

(If no pain go to question no. 24)

2. If you have pain before menstruation please rate:

(a and b)

(if you have pain both before and during answer both 2 and 3).

a. your pain at its worst

no pain at all ——— the most intense pain imaginable

b. your average pain

no pain at all ——— the most intense pain imaginable

3. If you have pain during menstruation please rate:

(a and b)

a. your pain at its worst

no pain at all ——— the most intense pain imaginable

b. your average pain

no pain at all ——— the most intense pain imaginable

4. If you have pelvic pain not related to menstruation please rate: (a and b)

a. your pain at its worst

no pain at all ——— the most intense pain imaginable

b. your average pain

no pain at all ——— the most intense pain imaginable

5. If you are in pain right now, please rate it:

no pain at all _____ the most intense pain imaginable

6. What part of the menstrual cycle are you in today?

menstruating____

1-5 days post menstruation____

6-15 days post menstruation____

16-23 days post menstruation____

24 or more days post menstruation (but not yet menstruating)____

7. How many days a month do you miss school and/or work because of pelvic or menstrual pain?

none____ 1____ 2____ 3____ 4____ 6-10____

over 10____

8. Does the pain affect your sleep patterns? yes____

no____

If yes do you:

sleep over 4 hours more than usual____

sleep 2 1/2-4 hours more than usual____

sleep 1/2-2 hours more than usual____

sleep 1/2-2 hours less than usual____

sleep 2 1/2-4 hours less than usual____

sleep over 4 hours less than usual____

9. Does the pain affect your productivity? yes____ no____

If yes, does it:

greatly reduce it____ moderately reduce it____

moderately increase it____ greatly increase it____

10. Does the pain affect your social life? yes____ no____

If yes does it:

greatly reduce it____ moderately reduce it____

greatly increase it____ moderately increase it____

does not increase or decrease it but affects it in other ways (please specify)

_____

_____

_____

11. Have you ever gone to a doctor because of your pelvic and/or menstrual pain? yes____ no____

If yes, what diagnosis did he/she give you? _____

_____

_____

What treatment did he/she prescribe? (please check all applicable).

medication _____ (specify). After using it my pain was:

the same as before___

less than before___

much less than before___

gone___

surgery _____ (specify). After undergoing it my pain was:

the same as before___

less than before___

much less than before___

gone____

exercise _____ (specify). After doing it my pain was:

the same as before___

less than before___

much less than before___

gone____

other _____ (specify). (e.g. relaxation, diet, vitamins)

After this my pain was:

the same as before___

less than before___

much less than before___

gone____

12. What do you do when you feel the pain is starting or when you are in pain? Please check all that apply.

take non-prescription medication (e.g. aspirin)

_____ (specify).

After taking it my pain is:

the same as before___

less than before___

much less than before___

gone____

take prescription medication _____ (specify)

After taking it my pain is:

the same as before___

less than before___

much less than before___

gone____

exercise _____ (specify).

After doing it my pain is:

the same as before___

less than before___

much less than before___

gone____

meditate _____ (specify).

After doing it my pain is:

the same as before___

less than before___

much less than before___

gone____

talk to a friend _____ After doing it my pain is:

the same as before___

less than before___

much less than before___

gone____

go to bed _____ After doing it my pain is:

the same as before___

less than before___

much less than before___

gone____

do something to take my mind off the pain _____

_____ (specify). After doing it my pain is:

the same as before___

less than before___

much less than before___

gone____

worry _____ After doing this my pain is:

the same as before___

less than before___

much less than before___

gone___

other_____

_____

_____ (specify). After doing this my pain is:

the same as before___

less than before___

much less than before___

gone____

13. If there was a treatment being offered for pelvic and/or menstrual pain, that did not involve drugs or surgery, would you be interested in it? yes____ no___.

If yes, how many hours would you be willing to devote to it?

1____ 2____ 3-5____ 6-10____ 11-15____

over 15____

14. Have you ever been pregnant? yes____ no____.

If yes, did you carry a baby to term (over 5 months)?

yes____ no____

15. How old are you? _____

16. At what age did you start menstruating? _____

17. Are your periods regular? yes____ no____

If yes, how often do you get them? every _____ days.

18. Do you smoke? yes____ no____

If yes, how many cigarettes do you smoke in a day? ____

19. Does anyone of your friends or family have pain before, after, or during menstruation? yes____ no____

If yes, please state what relationship they are to you (e.g. mother, friend)_____

20. Are you: underweight_____ overweight_____ neither_____

21. Are you using any birth control methods (including the pill)?

yes____ no____

If yes is it:

IUD____ pill____ diaphragm____

other_____ (specify).

22. Has the use of the above birth control method changed your pain?

greatly increased the pain_____

moderately increased the pain_____

no change in the pain at all_____

moderately reduced the pain_____

greatly reduced the pain_____

23. A few days before your period do you usually feel irritability, depression, bloating, breast tenderness and feeling like you cannot cope? yes____ no____

If yes, do you think you have pre-menstrual syndrome?

yes____ no____

24. Is there anything else you would like to tell us that you think may help us in designing the treatment approach?

_____

_____

THANK YOU FOR YOUR COOPERATION!

Appendix B

Items Used to Build the Treatment Questionnaire

Date_____

QUESTIONNAIRE .

For each of the following items please indicate how important you think it is for treatment of menstrual pain. If an item is not important at all circle the 1, if it is extremely important circle the 7, and if it is somewhere in between not important and extremely important circle the number 2 or 3 or 4 or 5 or 6 depending on how important you feel it is. This will enable us to know what women expect from treatment of menstrual pain.

not important at all extremely important
1 2 3 4 5 6 7

I expect the treatment to:

1. help me learn to regulate the amount of menstrual flow 1 2 3 4 5 6 7
2. help me gain better control over my mind...1 2 3 4 5 6 7
3. help me take my mind off the pain.....1 2 3 4 5 6 7
4. help me feel calmer about my periods.....1 2 3 4 5 6 7
5. help me relax my muscles in my lower back...1 2 3 4 5 6 7
6. help me make my pelvic area feel numb.....1 2 3 4 5 6 7
7. help me to feel less anxious about my period1 2 3 4 5 6 7
8. help me ease the tension in my body.....1 2 3 4 5 6 7
9. help me concentrate on other things.....1 2 3 4 5 6 7
10. help me relax my muscles in my abdomen.....1 2 3 4 5 6 7

11. help me increase the warmth in my pelvic area.....1 2 3 4 5 6 7

12. help me reduce the contractions.....1 2 3 4 5 6 7

13. help me think differently about my pain.....1 2 3 4 5 6 7

14. help me relax my body.....1 2 3 4 5 6 7

15. help me ease the tension in my mind.....1 2 3 4 5 6 7

16. help me control my body.....1 2 3 4 5 6 7

17. help my clear my mind.....1 2 3 4 5 6 7

18. help me relax my mind.....1 2 3 4 5 6 7

19. help my body react differently to the pain..1 2 3 4 5 6 7

20. help me plan my schedule so that I don't attempt to do too much when I'm in pain.....1 2 3 4 5 6 7

21. help me feel differently about my pain.....1 2 3 4 5 6 7

22. help me not to feel upset by the pain.....1 2 3 4 5 6 7

23. help me not to tense up because of the pain.1 2 3 4 5 6 7

24. help me not to exert myself physically when in pain....1 2 3 4 5 6 7

Please make a mark (--+--) on the following line at the point that represents the amount of menstrual pain you experience during your usual period.

no pain at all ——————————— the most intense pain imaginable

THANK YOU FOR YOUR COOPERATION!

Appendix C

Treatment Expectations Questionnaire

Date_____

QUESTIONNAIRE

For each of the following items please indicate how important you think it is for treatment of menstrual pain. If an item is not important at all circle the 1, if it is extremely important circle the 7, and if it is somewhere in between not important and extremely important circle the number 2 or 3 or 4 or 5 or 6 depending on how important you feel it is. This will enable us to know what women expect from treatment of menstrual pain.

not important at all extremely important
1 2 3 4 5 6 7

I expect the treatment to:

help me learn to regulate the amount of menstrual flow 1 2 3 4 5 6 7

help me gain better control over my mind.....1 2 3 4 5 6 7

help me feel calmer about my periods.....1 2 3 4 5 6 7

help me make my pelvic area feel numb.....1 2 3 4 5 6 7

help me to feel less anxious about my periods...1 2 3 4 5 6 7

help me ease the tension in my body.....1 2 3 4 5 6 7

help me concentrate on other things.....1 2 3 4 5 6 7

help me increase the warmth in my pelvic area...1 2 3 4 5 6 7

help me reduce the contractions.....1 2 3 4 5 6 7

help me relax my body.....1 2 3 4 5 6 7

help me control my body.....1 2 3 4 5 6 7

help me plan my schedule so that I don't attempt to do too much when I'm in pain.....1 2 3 4 5 6 7

help me feel differently about my pain.....1 2 3 4 5 6 7

help me not to feel upset by the pain.....1 2 3 4 5 6 7

THANK YOU FOR YOUR COOPERATION!

Appendix D

Pre-Treatment Questionnaire

Date_____

Name_____

Questionnaire

The first three questions ask you to rate your pain on a line. On one side is written: "no pain at all", and on the other: "the most intense pain imaginable". Please place a mark on the line in the following manner: ___|___ at the point that best represents your pain. These questions refer to the pain you experience during menstruation, and not to the pain you may experience before menstruation. The other questions require you to place a checkmark (✓) beside one of the answers. If you have any questions please do not hesitate to ask.

1. Please rate the pain of menstruation of your usual period

_____

no pain at all — the most intense pain imaginable

2. Please rate the pain of menstruation of your least painful period ever.

_____

no pain at all — the most intense pain imaginable

3. Please rate the pain of menstruation of your most painful period ever.

_____

no pain at all — the most intense pain imaginable

4. Please circle the words that best describe your usual menstrual pain. Do not circle more than one word in each group. You may omit any category that does not apply.

1	2	3	4	5
Flickering	Jumping	Pricking	Sharp	Pinching
Quivering	Flashing	Boring	Cutting	Pressing
Pulsing	Shooting	Drilling	Lacerating	Gnawing
Throbbing		Stabbing		Cramping
Beating		Lancinating		Crushing
Pounding				

6	7	8	9	10
Tugging	Hot	Tingling	Dull	Tender
Pulling	Burning	Itchy	Sore	Taut
Wrenching	Scalding	Smarting	Hurting	Rasping
	Searing	Stinging	Aching	Splitting
			Heavy	

11	12	13	14	15
Tiring	Sickening	Fearful	Punishing	Wretched
Exhausting	Suffocating	Frightful	Grueling	Blinding
		Terrifying	Cruel	
			Vicious	
			Killing	

Annoying

Troublesome

Miserable

Intense

Unbearable

5. The following is a list of common symptoms and feelings. For each item put a check under the category that best describes your experience during your most recent flow. If you are menstruating today, then check the category that best describes your experience today. Even if none of the categories is exactly correct, choose the one that best describes your experience. Please be sure to check one category for each item.

	None	Present Mild	Present Moderate	Present Strong	Present Severe
Muscle stiffness	___	___	___	___	___
Weight gain	___	___	___	___	___
Dizziness, faintness	___	___	___	___	___
Loneliness	___	___	___	___	___
Headache	___	___	___	___	___
Skin blemish or disorder	___	___	___	___	___
Cold sweats	___	___	___	___	___
Anxiety	___	___	___	___	___
Mood swings	___	___	___	___	___
Cramps	___	___	___	___	___
Painful or tender breasts	___	___	___	___	___

	None	Present Mild	Present Moderate	Present Strong	Present Severe
Nausea, vomiting	___	___	___	___	___
Crying	___	___	___	___	___
Backache	___	___	___	___	___
Swelling(breasts,abdomen)	___	___	___	___	___
Hot flashes	___	___	___	___	___
Irritability	___	___	___	___	___
Tension	___	___	___	___	___
Fatigue	___	___	___	___	___
Feeling sad or blue	___	___	___	___	___
General aches and pains	___	___	___	___	___
Restlessness	___	___	___	___	___
Insomnia	___	___	___	___	___
Poor school or work performance	___	___	___	___	___
Affectionate	___	___	___	___	___
Feelings of suffocation	___	___	___	___	___
Forgetfulness	___	___	___	___	___
Take naps, stay in bed	___	___	___	___	___
Orderliness	___	___	___	___	___
Chest pains	___	___	___	___	___
Confusion	___	___	___	___	___
Poor judgment	___	___	___	___	___
Stay at home	___	___	___	___	___
Excitement	___	___	___	___	___
Ringing in the ears	___	___	___	___	___

	None	Present Mild	Present Moderate	Present Strong	Present Severe
Difficulty concentrating	____	____	____	____	____
Avoid social activities	____	____	____	____	____
Feelings of well-being	____	____	____	____	____
Heart pounding	____	____	____	____	____
Distractable	____	____	____	____	____
Decreased efficiency	____	____	____	____	____
Bursts of energy, activity	____	____	____	____	____
Numbness, tingling	____	____	____	____	____
Minor accidents	____	____	____	____	____
Blind spots, fuzzy vision	____	____	____	____	____
Poor motor coordination	____	____	____	____	____
Increased appetite	____	____	____	____	____

6. Do you have your period (menstrual flow) today?

   Yes____ No____

   If not, when was your last menstrual period_____

   (please be as exact as possible).

   How often do you have menstrual periods?

   Every _____ days

7. How often do you miss school and/or work because of menstrual pain?

   never____ 1-2 times a year____ 3-5 times a year____

   6-8 times a year___ 9-11 times a year___ every month___

8. How much time do you usually miss from school and/or work?

   none___ 1 hour___ 2-3 hours___ 4-5 hours___

   6 hours - full day___ 2 days___ 3 or more days___

9. How does the pain affect your productivity?

does not affect it at all____ mildly reduces it____

moderately reduces it____ greatly reduces it____

10. How does the pain affect your social life?

does not affect it at all____ mildly reduces it____

moderately reduces it____ greatly reduces it____

11. When in pain do you:

sleep over 4 hours more than usual____

sleep 2 1/2-4 hours more than usual____

sleep 1/2-2 hours more than usual____

sleep the same amount as usual____

sleep 1/2-2 hours less than usual____

sleep 2 1/2-4 hours less than usual____

sleep over 4 hours less than usual____

12. Do you take any non-prescription medication for the pain (e.g. aspirin)? Yes____ No____

If yes, please tell us which one_____

Please write down how much and how often you take it:____

_____

_____

_____

13. Do you take any prescription medication (e.g. ponstan) for your menstrual pain? Yes____ No____

If yes, what kind do you take?_____

Please write down how much and how often you take it:____

_____

_____

_____

14. For each of the following items please indicate how important you think it is for treatment of your menstrual pain. If an item is not important at all circle the 1, if it is extremely important circle the 7, and if it is somewhere in between not important and extremely important circle the number 2 or 3 or 4 or 5 or 6 depending on how important you feel it is.

not important at all 1 2 3 4 5 6 7 extremely important

I expect the treatment to:

help me learn to regulate the amount of menstrual flow.1 2 3 4 5 6 7

help me gain better control over my mind.....1 2 3 4 5 6 7

help me feel calmer about my periods.....1 2 3 4 5 6 7

help me make my pelvic area feel numb.....1 2 3 4 5 6 7

help me to feel less anxious about my periods...1 2 3 4 5 6 7

help me ease the tension in my body.....1 2 3 4 5 6 7

help me concentrate on other things.....1 2 3 4 5 6 7

help me increase the warmth in my pelvic area...1 2 3 4 5 6 7

help me reduce the contractions.....1 2 3 4 5 6 7

help me relax my body.....1 2 3 4 5 6 7

help me control my body.....1 2 3 4 5 6 7

help me plan my schedule so that I don't attempt to do too much when I'm in pain.....1 2 3 4 5 6 7

help me feel differently about my pain.....1 2 3 4 5 6 7

help me not to feel upset by the pain.....1 2 3 4 5 6 7

15. Each of the following items is a belief statement with which you may agree or disagree. Beside each is a scale which ranges from strongly disagree (1) to strongly agree (6). For each of the following items, we would like you to circle the number that represents the extent to which you disagree or agree with the statement. Please make sure that you answer every item and that you circle only one number per item.

strongly disagree 1 — slightly agree 4

moderately disagree 2 — moderately agree 5

slightly disagree 3 — strongly agree 6

If I get sick, it is my own behavior which determines how soon I get well again 1 2 3 4 5 6

No matter what I do, if I am going to get sick, I will get sick 1 2 3 4 5 6

Having regular contact with my physician is the best way for me to avoid illness 1 2 3 4 5 6

Most things that affect my health happen to me by accident 1 2 3 4 5 6

Whenever I don't feel well, I should consult a medically trained professional 1 2 3 4 5 6

I am in control of my health	1	2	3	4	5	6
My family has a lot to do with my becoming sick or staying healthy	1	2	3	4	5	6
When I get sick I am to blame	1	2	3	4	5	6
Luck plays a big part in determining how soon I will recover from an illness	1	2	3	4	5	6
Health professionals control my health	1	2	3	4	5	6
My good health is largely a matter of good fortune	1	2	3	4	5	6
The main thing which affects my health is what I myself do	1	2	3	4	5	6
If I take care of myself, I can avoid illness	1	2	3	4	5	6
When I recover from an illness, it's usually because other people (for example, doctors, nurses, family, friends) have been taking good care of me	1	2	3	4	5	6
No matter what I do, I'm likely to get sick	1	2	3	4	5	6
If it's meant to be, I will stay health	1	2	3	4	5	6
If I take the right actions, I can stay healthy	1	2	3	4	5	6
Regarding my health, I can only do what my doctor tells me to do	1	2	3	4	5	6

16. Please fill in your:

    age____ . age when you had your first period____

    age when you started having painful periods____

    Do you have any bleeding in between periods?

    Yes, every period___ Yes, occasionally___

    Yes, rarely___ No, never____

17. Does anyone of your friends or family have pain during menstruation? Yes___ No____

    If yes, please state what relationship they are to you (e.g. mother, friend)_____

18. Does anyone of your friends or family have chronic or recurrent pain (e.g. rheumatism, low back pain, headaches)? Yes____ No____

    If yes, please state what kind of pain, and what relationship they are to you (e.g. mother, friend)

    _____

    _____

    _____

19. Do you have any other chronic or recurrent pain (e.g. rheumatism, low back pain, headaches)? Yes____ No____

    If yes, please state which_____

    _____

    _____

20. Have you ever gone to a doctor because of your menstrual pain? Yes____ No____

If yes, what diagnosis did he/she give you?_____

_____

_____

What treatment did he/she prescribe? (please check all applicable).

medication _____(specify). After using it my pain was

the same as before___

less than before___

much less than before___

gone_____

surgery _____ (specify). After undergoing it my pain was:

the same as before___

less than before___

much less than before___

gone____

exercise _____ (specify). After doing it my pain was:

the same as before___

less than before___

much less than before___

gone____

other _____ (specify). (e.g. relaxation, diet, vitamins). After this my pain was:

the same as before___

less than before___

much less than before___

gone____

21. What do you do when you feel the pain is starting or when you are in pain? Please check all that apply.

take non-prescription medication (e.g. aspirin)

_____ (specify). After taking it my pain is

the same as before___

less than before___

much less than before___

gone____

take prescription medication _____ (specify)

After taking it my pain is

the same as before___

less than before___

much less than before___

gone____

exercise _____ (specify).

After doing it my pain is:

the same as before___

less than before___

much less than before___

gone____

meditate _____ (specify).

After doing it my pain is:

the same as before___

less than before___

much less than before___

gone____

talk to a friend _____ After doing it my pain is

the same as before___

less than before___

much less than before___

gone____

go to bed _____ After doing it my pain is

the same as before___

less than before___

much less than before___

gone____

do something to take my mind off the pain _____

_____ (specify).

After doing it my pain is:

the same as before___

less than before___

much less than before___

gone____

worry _____ After doing this my pain is

the same as before___

less than before___

much less than before___

gone___

other_____(specify)

After doing this my pain is

the same as before___

less than before___

much less than before___

gone____

22. Have you ever been pregnant? yes____ no____

If yes, did you carry a baby to term (over 5 months)?

yes____ no____

23. Do you take oral contraceptives (birth control pills) either for the pain or otherwise? Yes____ No____

24. How does the pain affect your sex life?

not applicable____ no affect____ mildly reduces it____

moderately reduces it____ greatly reduces it____

THANK YOU FOR YOUR COOPERATION!

Appendix E

Baseline Questionnaire

Date_____

Name_____

Number of baseline period (circle): 1 2

Questionnaire

Please fill out this questionnaire during your next menstrual period. Your treatment will begin after two menstrual periods. Therefore you will fill out two questionnaires. We will call you at home to inform you when the treatment will begin. The first three questions ask you to rate your pain on a line. On one side is written: "no pain at all", and on the other: "the most intense pain imaginable". Please place a mark on the line in the following manner: ___|___ at the point that best represents your pain. These questions refer to the pain you experience during menstruation, and not to the pain you may experience before menstruation. The other questions require you to place a checkmark (✓) beside one of the answers. If you have any questions please do not hesitate to ask.

1. Please rate your average pain during this menstrual period

no pain at all		the most intense pain imaginable

2. Please rate your least pain during this menstrual period.

no pain at all		the most intense pain imaginable

3. Please rate your most pain during this menstrual period.

no pain at all — the most intense pain imaginable

4. Please circle the words that best describe your menstrual pain during this period. Do not circle more than one word in each group. You may omit any group that does not apply.

1	2	3	4	5
Flickering	Jumping	Pricking	Sharp	Pinching
Quivering	Flashing	Boring	Cutting	Pressing
Flicking	Shooting	Drilling	Lacerating	Gnawing
Throbbing		Stabbing		Cramping
Beating		Lancinating		Crushing
Pounding				
6	**7**	**8**	**9**	**10**
Tugging	Hot	Tingling	Dull	Tender
Pulling	Burning	Itchy	Sore	Taut
Wrenching	Scalding	Smarting	Hurting	Rasping
	Searing	Stinging	Aching	Splitting
			Heavy	
11	**12**	**13**	**14**	**15**
Tiring	Sickening	Fearful	Punishing	Wretched
Exhausting	Suffocating	Frightful	Grueling	Blinding
		Terrifying	Cruel	
			Vicious	
			Killing	

Annoying

Troublesome

Miserable

Intense

Unbearable

5. The following is a list of common symptoms and feelings. For each item put a check under the category that best describes your experience today. Even if none of the categories is exactly correct, choose the one that best describes your experience. Please be sure to check one category for each item.

	None	Present Mild	Present Moderate	Present Strong	Present Severe
Muscle stiffness	___	___	___	___	___
Weight gain	___	___	___	___	___
Dizziness, faintness	___	___	___	___	___
Loneliness	___	___	___	___	___
Headache	___	___	___	___	___
Skin blemish or disorder	___	___	___	___	___
Cold sweats	___	___	___	___	___
Anxiety	___	___	___	___	___
Mood swings	___	___	___	___	___
Cramps	___	___	___	___	___
Painful or tender breasts	___	___	___	___	___
Nausea, vomiting	___	___	___	___	___
Crying	___	___	___	___	___

	None	Present Mild	Present Moderate	Present Strong	Present Severe
Backache	___	___	___	___	___
Swelling (breasts, abdomen)	___	___	___	___	___
Hot flashes	___	___	___	___	___
Irritability	___	___	___	___	___
Tension	___	___	___	___	___
Fatigue	___	___	___	___	___
Feeling sad or blue	___	___	___	___	___
General aches and pains	___	___	___	___	___
Restlessness	___	___	___	___	___
Insomnia	___	___	___	___	___
Poor school or work performance	___	___	___	___	___
Affectionate	___	___	___	___	___
Feelings of suffocation	___	___	___	___	___
Forgetfulness	___	___	___	___	___
Take naps, stay in bed	___	___	___	___	___
Orderliness	___	___	___	___	___
Chest pains	___	___	___	___	___
Confusion	___	___	___	___	___
Poor judgment	___	___	___	___	___
Stay at home	___	___	___	___	___
Excitement	___	___	___	___	___
Ringing in the ears	___	___	___	___	___
Difficulty concentrating	___	___	___	___	___
Avoid social activities	___	___	___	___	___

	None	Present Mild	Present Moderate	Present Strong	Present Severe
Feelings of well-being	____	____	____	____	____
Heart pounding	____	____	____	____	____
Distractable	____	____	____	____	____
Decreased efficiency	____	____	____	____	____
Bursts of energy, activity	____	____	____	____	____
Numbness, tingling	____	____	____	____	____
Minor accidents	____	____	____	____	____
Blind spots, fuzzy vision	____	____	____	____	____
Poor motor coordination	____	____	____	____	____
Increased appetite	____	____	____	____	____

6. Did you miss school and/or work because of pain during this menstrual period? Yes___. No___

   If yes how much time did you miss?

   1 hour____ 2-3 hours____ 4-5 hours____

   6 hours - 1day___ 2 days____ 3 days____ 4 days____.

7. How did the pain during this period affect your productivity?

   did not affect it at all____ mildly reduced it____

   moderately reduced it____ greatly reduced it____

8. How did the pain during this period affect your social life?

   did not affect it at all____ mildly reduced it____

   moderately reduced it____ greatly reduced it____

9. When in pain during this period did you:

sleep over 4 hours more than usual____

sleep 2 1/2-4 hours more than usual____

sleep 1/2-2 hours more than usual____

sleep the same amount as usual____

sleep 1/2-2 hours less than usual____

sleep 2 1/2-4 hours less than usual____

sleep over 4 hours less than usual____

10. Did you take any non-prescription medication for the pain (e.g. aspirin)? Yes____ No____

If yes, please tell us which one_____

Please write down how much and how often you took it:____

_____

_____

11. Did you take any prescription medication (e.g. ponstan) for your menstrual pain? Yes____ No____

If yes, what kind did you take?_____

Please write down how much and how often you took it:____

_____

12. Did the pain affect your sex life?

not applicable____ no affect____ mildly reduced it____

moderately reduced it____ greatly reduced it____

THANK YOU FOR YOUR COOPERATION!

Helene Wallach

Ph.D. Candidate

Department of Psychology

University of Western Ontario

Appendix F

Treatment Expectations Questionnaire

Date_____

QUESTIONNAIRE

For each of the following items please indicate how important you think it is for treatment of menstrual pain. If an item is not important at all circle the 1, if it is extremely important circle the 7, and if it is somewhere in between not important and extremely important circle the number 2 or 3 or 4 or 5 or 6 depending on how important you feel it is. This will enable us to know what women expect from treatment of menstrual pain.

not important at all extremely important
1 2 3 4 5 6 7

I expect the treatment to:

help me learn to regulate the amount of menstrual flow 1 2 3 4 5 6 7

help me gain better control over my mind.....1 2 3 4 5 6 7

help me feel calmer about my periods.....1 2 3 4 5 6 7

help me make my pelvic area feel numb.....1 2 3 4 5 6 7

help me to feel less anxious about my periods...1 2 3 4 5 6 7

help me ease the tension in my body.....1 2 3 4 5 6 7

help me concentrate on other things.....1 2 3 4 5 6 7

help me increase the warmth in my pelvic area...1 2 3 4 5 6 7

help me reduce the contractions.....1 2 3 4 5 6 7

help me relax my body.....1 2 3 4 5 6 7

help me control my body.....1 2 3 4 5 6 7

help me plan my schedule so that I don't attempt to do too much when I'm in pain.....1 2 3 4 5 6 7

help me feel differently about my pain.....1 2 3 4 5 6 7

help me not to feel upset by the pain.....1 2 3 4 5 6 7

THANK YOU FOR YOUR COOPERATION!

Appendix G

Treatment Manipulation Questionnaire

Date_____

Name_____

TREATMENT CONTENT QUESTIONNAIRE

For each of the following items please indicate how extensively you think it was covered in the treatment you received. If an item was not covered at all circle the 1, if it was extensively covered circle the 7, and if it is somewhere in between not covered and extensively covered circle the number 2 or 3 or 4 or 5 or 6 depending on how extensively you feel it was covered.

not covered at all extensively covered
1 2 3 4 5 6 7

The treatment:

helped me learn to regulate the amount of menstrual flow 1 2 3 4 5 6 7

helped me gain better control over my mind.....1 2 3 4 5 6 7

helped me feel calmer about my periods.....1 2 3 4 5 6 7

helped me make my pelvic area feel numb.....1 2 3 4 5 6 7

helped me to feel less anxious about my periods..1 2 3 4 5 6 7

helped me ease the tension in my body.....1 2 3 4 5 6 7

helped me concentrate on other things.....1 2 3 4 5 6 7

helped me increase the warmth in my pelvic area..1 2 3 4 5 6 7

helped me reduce the contractions.....1 2 3 4 5 6 7

helped me relax my body.....1 2 3 4 5 6 7

helped me control my body.....1 2 3 4 5 6 7

helped me plan my schedule so that I don't attempt to do too much when I'm in pain. 1 2 3 4 5 6 7

helped me feel differently about my pain.....1 2 3 4 5 6 7

helped me not to feel upset by the pain.....1 2 3 4 5 6 7

THANK YOU FOR YOUR COOPERATION!

Appendix H

Post-Treatment Questionnaire

Date_____

Name_____

Post treatment menstrual period (please circle): 1 2

Questionnaire

Please fill out this questionnaire immediately after your next menstrual period. The first three questions ask you to rate your pain on a line. On one side is written: "no pain at all", and on the other: "the most intense pain imaginable". Please place a mark on the line in the following manner: ___|___ at the point that best represents your pain. These questions refer to the pain you experience during menstruation, and not to the pain you may experience before menstruation. The other questions require you to place a checkmark (✓) beside one of the answers. If you have any questions please do not hesitate to ask.

1. Please rate your average pain during this menstrual period.

no pain at all _____ the most intense pain imaginable

2. Please rate your least pain during this menstrual period.

no pain at all _____ the most intense pain imaginable

3. Please rate your most sever pain during this menstrual period.

no pain at all _____ the most intense pain imaginable

4. Please circle the words that best describe your menstrual pain during this period. Do not circle more than one word in each group. You may omit any group that does not apply

1	2	3	4	5
Flickering	Jumping	Pricking	Sharp	Pinching
Quivering	Flashing	Boring	Cutting	Pressing
Pulsing	Shooting	Drilling	Lacerating	Gnawing
Throbbing		Stabbing		Cramping
Beating		Lancinating		Crushing
Pounding				

6	7	8	9	10
Tugging	Hot	Tingling	Dull	Tender
Pulling	Burning	Itchy	Sore	Taut
Wrenching	Scalding	Smarting	Hurting	Rasping
	Searing	Stinging	Aching	Splitting
			Heavy	

11	12	13	14	15
Tiring	Sickening	Fearful	Punishing	Wretched
Exhausting	Suffocating	Frightful	Grueling	Blinding
		Terrifying	Cruel	
			Vicious	
			Killing	

Annoying

Troublesome

Miserable

Intense

Unbearable

5. The following is a list of common symptoms and feelings. For each item put a check under the category that best describes your experience today. Even if none of the categories is exactly correct, choose the one that best describes your experience. Please be sure to check one category for each item.

	None	Present Mild	Present Moderate	Present Strong	Present Severe
Muscle stiffness	___	___	___	___	___
Weight gain	___	___	___	___	___
Dizziness, faintness	___	___	___	___	___
Loneliness	___	___	___	___	___
Headache	___	___	___	___	___
Skin blemish or disorder	___	___	___	___	___
Cold sweats	___	___	___	___	___
Anxiety	___	___	___	___	___
Mood swings	___	___	___	___	___
Cramps	___	___	___	___	___
Painful or tender breasts	___	___	___	___	___
Nausea, vomiting	___	___	___	___	___
Crying	___	___	___	___	___

	None	Present Mild	Present Moderate	Present Strong	Present Severe
Backache	___	___	___	___	___
Swelling (breasts, abdomen)	___	___	___	___	___
Hot flashes	___	___	___	___	___
Irritability	___	___	___	___	___
Tension	___	___	___	___	___
Fatigue	___	___	___	___	___
Feeling sad or blue	___	___	___	___	___
General aches and pains	___	___	___	___	___
Restlessness	___	___	___	___	___
Insomnia	___	___	___	___	___
Poor school or work performance.	___	___	___	___	___
Affectionate	___	___	___	___	___
Feelings of suffocation	___	___	___	___	___
Forgetfulness	___	___	___	___	___
Take naps, stay in bed	___	___	___	___	___
Orderliness	___	___	___	___	___
Chest pains	___	___	___	___	___
Confusion	___	___	___	___	___
Poor judgment	___	___	___	___	___
Stay at home	___	___	___	___	___
Excitement	___	___	___	___	___
Ringing in the ears	___	___	___	___	___
Difficulty concentrating	___	___	___	___	___
Avoid social activities	___	___	___	___	___

	None	Present Mild	Present Moderate	Present Strong	Present Severe
Feelings of well-being	___	___	___	___	___
Heart pounding	___	___	___	___	___
Distractable	___	___	___	___	___
Decreased efficiency	___	___	___	___	___
Bursts of energy, activity	___	___	___	___	___
Numbness, tingling	___	___	___	___	___
Minor accidents	___	___	___	___	___
Blind spots, fuzzy vision	___	___	___	___	___
Poor motor coordination	___	___	___	___	___
Increased appetite	___	___	___	___	___

6. Did you miss school and/or work because of pain during this menstrual period? Yes___ No___

   If yes, how many hours did you miss?

   1 hour___ 2-3 hours___ 4-5 hours___

   6 hours - 1 day___ 2 days___ 3 or more days___

7. How did the pain during this period affect your productivity?

   did not affect it at all___ mildly reduced it___

   moderately reduced it___ greatly reduced it___

8. How did the pain during this period affect your social life?

   did not affect it at all___ mildly reduced it___

   moderately reduced it___ greatly reduced it___

9. When in pain during this period did you:

sleep over 4 hours more than usual___

sleep 2 1/2-4 hours more than usual___

sleep 1/2-2 hours more than usual___

sleep the same amount as usual___

sleep 1/2-2 hours less than usual___

sleep 2 1/2-4 hours less than usual___

sleep over 4 hours less than usual___

10. Did you take any non-prescription medication for the pain (e.g. aspirin)? Yes___ No___

If yes, please tell us which one_____

Please write down how much and how often you took it:___

_____

_____

_____

11. Did you take any prescription medication (e.g. ponstan) for your menstrual pain? Yes___ No___

If yes, what kind did you take?_____

Please write down how much and how often you took it:___

_____

_____

_____

12. Did you practice the techniques taught in this treatment at home between sessions?

not at all___ rarely___ sometimes___

almost always___ always___

13. Do you feel that this treatment helped reduce your pain?

not at all____ somewhat____ very much____

a great deal____

14. Do you feel that this treatment helped you deal with your pain better?

not at all____ somewhat____ very much____

a great deal____

15. Was what you did in treatment similar to what you expected to do?

not at all similar____ somewhat similar____

very similar____ identical____

16. How would you improve this treatment?____

THANK YOU FOR YOUR COOPERATION!

Helene Wallach

Ph.D. Candidate

Department of Psychology

University of Western Ontario

Tel. #: 679-2612

Appendix I

Follow-Up Questionnaire

Date_____

Name_____

Post treatment period covered in this questionnaire (please circle): 3 4 5 6

Questionnaire

Please fill out this questionnaire immediately after each of your next four menstrual periods. The first three questions ask you to rate your pain on a line. On one side is written: "no pain at all", and on the other: "the most intense pain imaginable". Please place a mark on the line in the following manner: ___|___ at the point that best represents your pain. These questions refer to the pain you experience during menstruation, and not to the pain you may experience before menstruation. The other questions require you to place a checkmark (✓) beside one of the answers. If you have any questions please do not hesitate to ask.

1. Please rate your average pain during this menstrual period.

no pain at all _____ the most intense pain imaginable

2. Please rate your least pain during this menstrual period.

no pain at all _____ the most intense pain imaginable

3. Please rate your most pain during this menstrual period.

no pain at all ——————————— the most intense pain imaginable

4. Please circle the words that best describe your menstrual pain during this period. Do not circle more than one word in each group. You may omit any group that does not apply.

1	2	3	4	5
Flickering	Jumping	Pricking	Sharp	Pinching
Quivering	Flashing	Boring	Cutting	Pressing
Pulsing	Shooting	Drilling	Lacerating	Gnawing
Throbbing		Stabbing		Cramping
Beating		Lancinating		Crushing
Pounding				

6	7	8	9	10
Tugging	Hot	Tingling	Dull	Tender
Pulling	Burning	Itchy	Sore	Taut
Wrenching	Scalding	Smarting	Hurting	Rasping
	Searing	Stinging	Aching	Splitting
			Heavy	

11	12	13	14	15
Tiring	Sickening	Fearful	Punishing	Wretched
Exhausting	Suffocating	Frightful	Grueling	Blinding
		Terrifying	Cruel	
			Vicious	
			Killing	

Annoying

Troublesome

Miserable

Intense

Unbearable

5. The following is a list of common symptoms and feelings. For each item put a check under the category that best describes your experience today. Even if none of the categories is exactly correct, choose the one that best describes your experience. Please be sure to check one category for each item.

	None	Present Mild	Present Moderate	Present Strong	Present Severe
Muscle stiffness	___	___	___	___	___
Weight gain	___	___	___	___	___
Dizziness, faintness	___	___	___	___	___
Loneliness	___	___	___	___	___
Headache	___	___	___	___	___
Skin blemish or disorder	___	___	___	___	___
Cold sweats	___	___	___	___	___
Anxiety	___	___	___	___	___
Mood swings	___	___	___	___	___
Cramps	___	___	___	___	___
Painful or tender breasts	___	___	___	___	___
Nausea, vomiting	___	___	___	___	___
Crying	___	___	___	___	___

	None	Present Mild	Present Moderate	Present Strong	Present Severe
Backache	___	___	___	___	___
Swelling (breasts, abdomen)	___	___	___	___	___
Hot flashes	___	___	___	___	___
Irritability	___	___	___	___	___
Tension	___	___	___	___	___
Fatigue	___	___	___	___	___
Feeling sad or blue	___	___	___	___	___
General aches and pains	___	___	___	___	___
Restlessness	___	___	___	___	___
Insomnia	___	___	___	___	___
Poor school or work performance	___	___	___	___	___
Affectionate	___	___	___	___	___
Feelings of suffocation	___	___	___	___	___
Forgetfulness	___	___	___	___	___
Take naps, stay in bed	___	___	___	___	___
Orderliness	___	___	___	___	___
Chest pains	___	___	___	___	___
Confusion	___	___	___	___	___
Poor judgment	___	___	___	___	___
Stay at home	___	___	___	___	___
Excitement	___	___	___	___	___
Ringing in the ears	___	___	___	___	___
Difficulty concentrating	___	___	___	___	___
Avoid social activities	___	___	___	___	___

	None	Present Mild	Present Moderate	Present Strong	Present Severe
Feelings of well-being	___	___	___	___	___
Heart pounding	___	___	___	___	___
Distractable	___	___	___	___	___
Decreased efficiency	___	___	___	___	___
Bursts of energy, activity	___	___	___	___	___
Numbness, tingling	___	___	___	___	___
Minor accidents	___	___	___	___	___
Blind spots, fuzzy vision	___	___	___	___	___
Poor motor coordination	___	___	___	___	___
Increased appetite	___	___	___	___	___

6. Did you miss school and/or work because of pain during this menstrual period? Yes____ No____

   If yes, how much time did you miss?

   1 hour___ 2-3 hours___ 4-5 hours___ 6 hours-1 day___

   2 days___ 3 or more days___

7. How did the pain during this period affect your productivity?

   did not affect it at all___ mildly reduced it___

   moderately reduced it___ greatly reduced it___

8. How did the pain during this period affect your social life?

   did not affect it at all___ mildly reduced it___

   moderately reduced it___ greatly reduced it___

9. When in pain during this period did you:

sleep over 4 hours more than usual____

sleep 2 1/2-4 hours more than usual____

sleep 1/2-2 hours more than usual____

sleep the same amount as usual____

sleep I/2-2 hours less than usual____

sleep 2 1/2-4 hours less than usual____

sleep over 4 hours less than usual____

10. Did you take any non-prescription medication for the pain (e.g. aspirin)? Yes____ No____

If yes, please tell us which one_____

Please write down how much and how often you took it:____

_____

_____

_____

11. Did you take any prescription medication (e.g. ponstan) for your menstrual pain? Yes____ No____

If yes, what kind did you take?_____

Please write down how much and how often you took it:____

_____

_____

_____

THANK YOU FOR YOUR COOPERATION!

Helene Wallach

Ph.D. Candidate

Department of Psychology

University of Western Ontario

Appendix J

Consent Forms

General Consent Form

Consent Form

DEAR PARTICIPANT,

Thank you for volunteering to this research project. As part of this project you will be interviewed and asked to answer a questionnaire. After that you will be given another questionnaire to fill out at home during two menstrual periods. You will be scheduled in to a treatment group that will start after your second menstrual period. The group will meet for two hours once a week for four weeks. When you come for your first group you will be given more information about the treatment. You will also be asked to fill out two more questionnaires, one in the group and one at home after your next menstrual period. And finally, we will be asking you to fill out a questionnaire after the next four menstrual periods, so we can determine how you have benefitted from the treatment. Each questionnaire will take between 10-20 minutes of your time.

This research project will be comparing three different treatment approaches for dysmenorrhea. All groups will be led by Mrs. Helene Wallach and supervised by Dr. G. Rollman. If we find that one approach is better than the other two, you will be given the opportunity to try it.

If you make any changes in your use of prescription or non-prescription medication for menstrual pain (including oral contraceptives), please inform us.

Your participation in this study is voluntary, and you may withdraw at anytime. All data will be kept confidential.

Thank you for your cooperation.

Name: _____

Signature: _____

Helene Wallach
PhD Candidate, Department of Psychology, Univ. of Western Ontario

Attention-Control Consent Form

Consent Form

DEAR PARTICIPANT,

Thank you for volunteering to this research project. At this stage you will participate in four treatment sessions. The treatment will consist of discussing your experiences during menstruation so you can learn different ways of controlling the painful menstrual cramps you experience along with your menstrual periods. All groups will be led by H. Wallach (supervised by Dr. G. Rollman).

In the last session you will be given two very short questionnaires to fill out. In addition you will be asked to fill out one questionnaire after each of your next two menstrual periods, and a follow up questionnaire several months later.

If you make any changes in your use of prescription or non-prescription medications for your menstrual pain (including oral contraceptives), please inform us.

Your participation in this study is voluntary, and you may withdraw at anytime. All data will be kept confidential.

Thank you for your cooperation.

Name: _____

Signature: _____

Helene Wallach
PhD Candidate
Department of Psychology
University of Western Ontario

Cognitive Treatment Consent Form

Consent Form

DEAR PARTICIPANT,

Thank you for volunteering to this research project. At this stage you will participate in four treatment sessions. The treatment will consist of learning how to use control over your thinking and attention to gain control over the painful menstrual cramps you experience along with your menstrual periods. The groups will be led by H. Wallach (supervised by Dr. G. Rollman).

In the last session you will be given two very short questionnaires to fill out. In addition you will be asked to fill out one questionnaire after each of your next two menstrual periods, and a follow up questionnaire after several months.

If you make any changes in your use of prescription or non-prescription medications for your menstrual pain (including oral contraceptives), please inform us.

Your participation in this group is voluntary, and you may withdraw at anytime. All data will be kept confidential.

Thank you for your cooperation.

Name: _____

Signature: _____

Helene Wallach
PhD Candidate
Department of Psychology
University of Western Ontario

Somatic Treatment Consent Form

Consent Form

DEAR PARTICIPANT;

Thank you for volunteering to this research project. At this stage you will participate in four treatment sessions. The treatment will consist of learning how to fully relax your body so that you can eliminate the painful menstrual cramps you experience along with your menstrual periods. The groups will be run by Mrs. H. Wallach (supervised by Dr. G. Rollman).

In the last session you will be given two very short questionnaires to fill out. In addition you will be asked to fill out one questionnaire after each of your next two menstrual periods, and a follow up questionnaire several months later.

If you make any changes in your use of prescription or non-prescription medications for your menstrual pain (including oral contraceptives), please inform us.

Your participation in this study is voluntary, and you may withdraw at anytime. All data will be kept confidential.

Thank you for your cooperation.

Name: _____

Signature: _____

Helena Wallach
PhD Candidate
Department of Psychology
University of Western Ontario

Combined Treatment Consent Form

Consent Form

DEAR PARTICIPANT,

Thank you for volunteering to this research project. At this stage you will participate in four treatment sessions. The treatment will consist of learning how to use control over your thinking and attention as well as how to fully relax your body so that you can eliminate the painful menstrual cramps you experience along with your menstrual periods. The groups will be run by H. Wallach (supervised by Dr. G. Rollman).

In the last session you will be given two very short questionnaires to fill out. In addition you will be asked to fill out one questionnaire after each of your next two menstrual periods, and a follow up questionnaire several months later.

If you make any changes in your use of prescription or non-prescription medications for your menstrual pain (including oral contraceptives), please inform us.

Your participation in this study is voluntary, and you may withdraw at anytime. All data will be kept confidential.

Thank you for your cooperation.

Name: _____

Signature: _____

Helene Wallach
PhD Candidate
Department of Psychology
University of Western Ontario

Appendix K

Feedback Sent to the Participants

DEAR PARTICIPANTS,

The study you participated in and the data analysis are completed and I am happy to send you the results.

In the study there were several treatment groups. All groups were explained the reason for the pain, and how the treatment will help. They were also taught how to reduce the pain. In addition, most groups (all but the discussion group) practiced the techniques while imagining they were in pain. The groups were:

1. A somatic treatment group. This group was taught various methods of relaxation (using muscle groups, using breathing, using imagery, etc.) and to numb the menstrual discomfort area (using imagery of a hot liquid).

2. A cognitive treatment group. This group was taught to relabel the pain (use words other than pain to refer to the sensation), to use various methods of distraction (to distract them from the pain) and to use coping self-statements (statements they use to remind themselves how to cope with the pain).

3. A combined treatment group. This group received a combination of the somatic and cognitive treatment groups that were just described.

4. A discussion group. In this group the participants discussed issues relevant to dysmenorrhea (e.g. family and physicians attitudes to women with painful menstruation) and methods to reduce it. In addition they planned their coping methods for their next menstrual period.

Not enough women participated in the discussion group, therefore no comparisons between this group and the others were made. From looking at the data, it appears that the women in this group feel better about themselves, and their menstrual periods, after treatment, but their pain and discomfort levels were not reduced.

The study looked at pain measures, non-pain measures and medication usage.

Pain measures: We found that most women in all groups reduced pain levels from pre to post treatment. More women improved on the average pain during their period (74% of the women improved) and on the most pain during their period (71% of the women improved) than on the other pain measures (43% to 64% of the women improved). For each measure we found that some of the women

improved greatly after treatment, while others improved little or not at all. For six of the seven pain measures there were no differences among the groups. For the evaluative pain measure (this measures the subjective intensity of the pain), women in the cognitive group improved more than women in the somatic group.

Non-pain measures: Most of these measures were reduced from pre to post treatment. Women improved on the amount of time they missed from work and/or school, the degree menstrual pain interferes with productivity and social life, the degree it interferes with sleep and the effect it has on general bodily functions such as cold sweats, nausea/vomiting, bursts of energy, etc. As with the pain variables, here as well, there was a large variation between women on the degree of improvement after treatment. There were no differences on improvement among the three groups.

No improvement was seen on the following menstrual discomfort measures: water retention, negative affect, concentration and control.

Medication usage: Over half the women in the study reduced their medication intake after treatment. Only two women increased their dosage. The amount of change in medication intake differs among the three groups. Therefore it is likely that some of the differences among the groups, in reduction in pain and discomfort after treatment, was cancelled out by the reduction in medication usage.

By 4-6 months after treatment, the women in the combined treatment group were using less medication than the other groups and the women in the somatic treatment group were using the most.

Feedback on post treatment questionnaire: The feedback was mostly positive. Apparently most of you feel that you benefited from treatment. You also had some very good suggestions for future treatment. Thank you.

Summary: To sum it up, you seemed to benefit from being in the treatment. There were only slight differences among the treatment groups. Benefits from treatment were in both pain and non-pain measures, as well as in medication usage.

If you have any questions, or suggestions, please do not hesitate to contact me at: 438-5272, or call: 679-2111, ask for the department of psychology, and leave a message for me.

THANK YOU ALL FOR PARTICIPATING IN THIS STUDY.

Helene S. Wallach
Ph.D. Candidate

Appendix L

Time Main Effect Individual ANOVAs on Pain Variables Comparing Cognitive, Somatic and Wait-list Control Groups+

	Hypothesis MS	Error MS	F
usual	4322.34	154.34	28.00*
least	156.54	35.66	4.39
most	7390.49	166.34	44.43*
sensory	186.13	10.05	18.52*
affective	22.81	1.54	14.77*
evaluative	13.23	0.44	29.95*
Moos-pain	77.53	3.02	25.64*

+ df=1,12

* $p < 0.002$

Appendix M

Time Main Effect Individual ANOVAs on Non-Pain Variables Comparing Cognitive, Somatic and Wait-List Control Groups

	Hypothesis MS	Error MS	F
Moos negative affect	21.66	14.26	1.52
Moos behavior change	120.65	4.94	24.40**
time missed	13.02	1.07	12.08*
productivity	4.70	0.34	13.62*
social	7.06	0.21	33.23**
sleep	1.90	0.46	4.14

* $p < 0.005$

** $p < 0.0005$

Appendix N

Time Main Effect Individual ANOVAs on Pain Variables Comparing Cognitive, Somatic and Combined Groups+

	Hypothesis MS	Error MS	F
usual	3172.84	223.75	14.18**
least	233.56	60.01	3.89*
most	4823.30	296.22	16.28**
sensory	190.54	14.19	13.43**
affective	21.94	1.86	11.82**
evaluative	10.21	0.81	12.62**
Moos-pain	76.23	5.07	15.02**

+ df=2,24

* $p < 0.03$

** $p < 0.0005$

Appendix O

Time Main Effect Individual ANOVAs on Non-Pain Variables' Comparing Cognitive, Somatic and Combined Groups+

	Hypothesis MS	Error MS	F	p value
Moos-affective	21.50	15.17	1.42	0.2570
Moos-behavior	125.07	4.43	28.25	0.0005
time missed	12.96	1.08	12.02	0.0050
productivity	6.03	0.39	15.31	0.0020
social interference	8.68	0.20	43.14	0.0005
sleep interference	2.50	0.44	5.65	0.0350

+ df=2,23